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To—Major London

Personal

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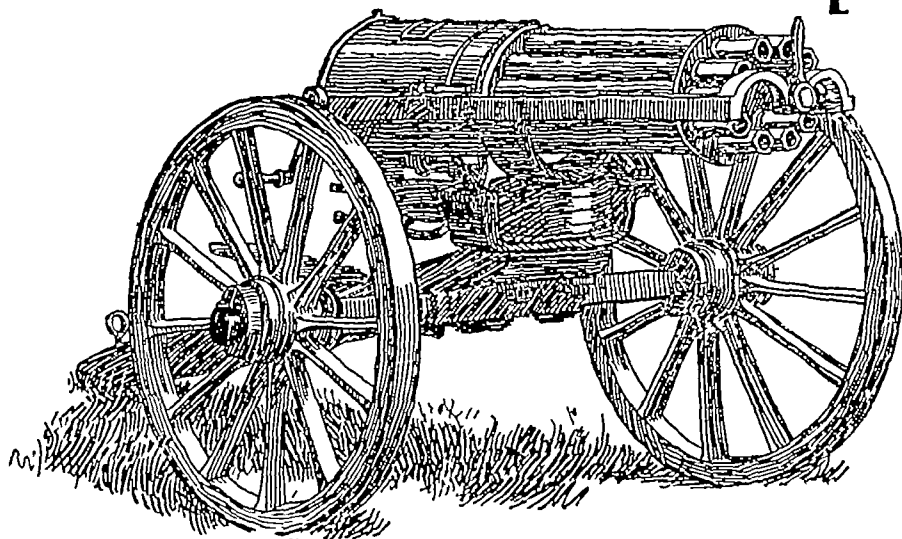
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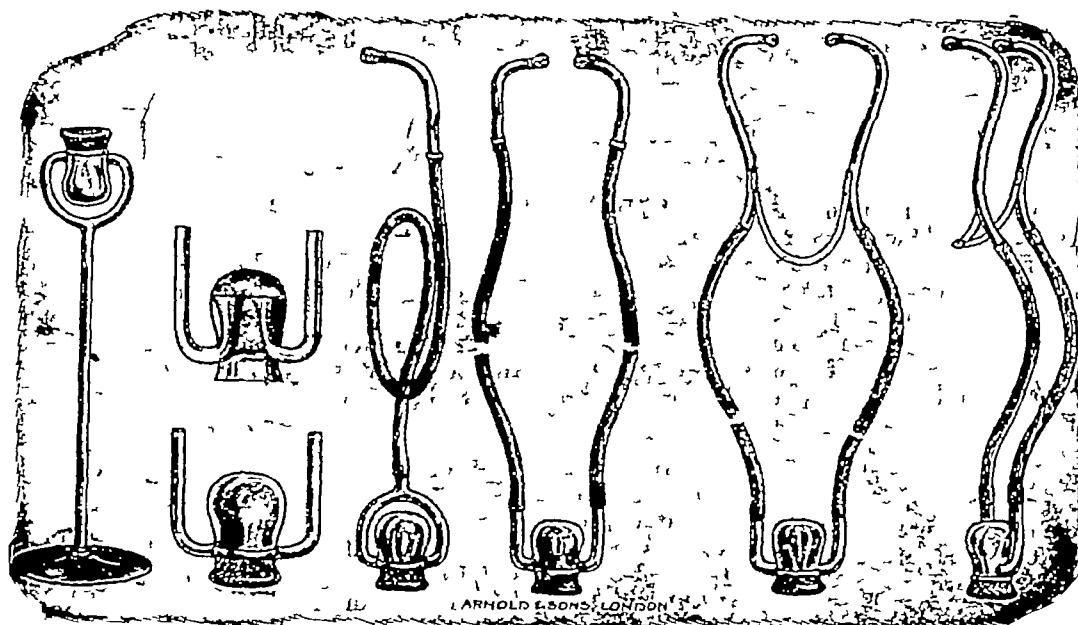
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FIG A FIG B FIG C FIG D FIG E FIG F

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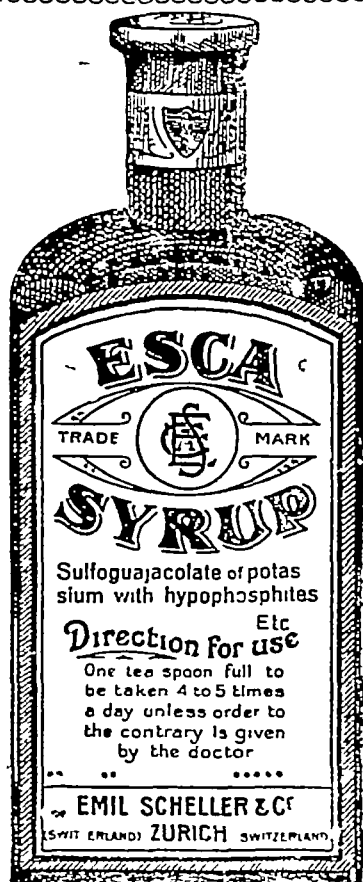
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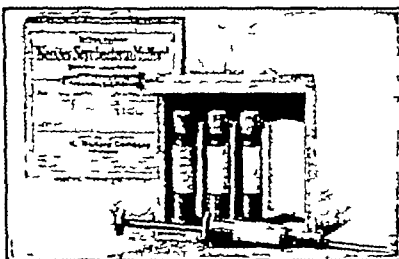
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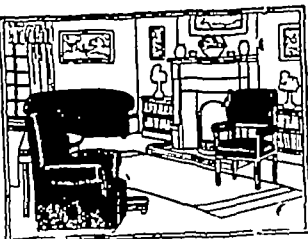
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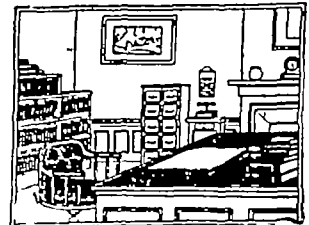
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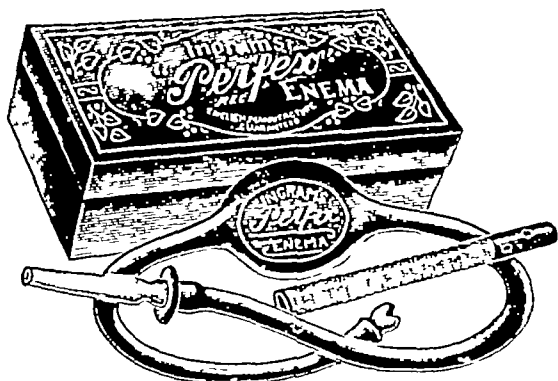
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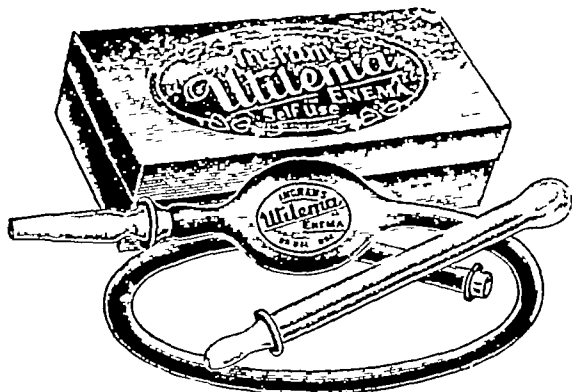
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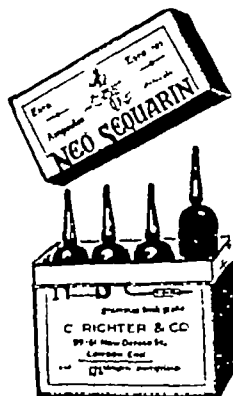
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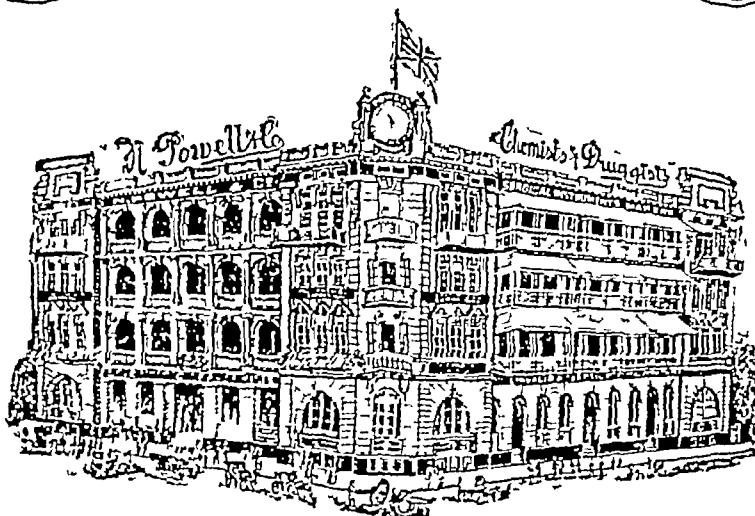
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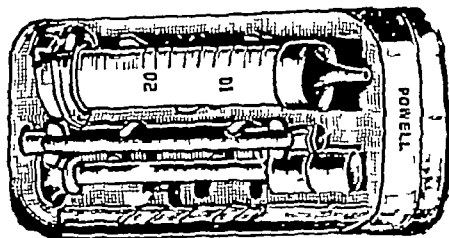


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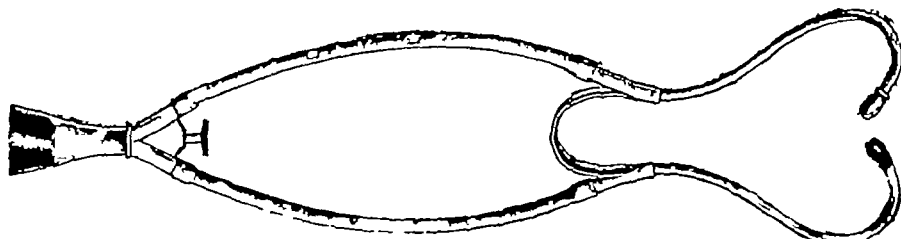
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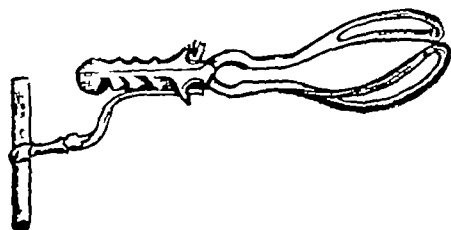
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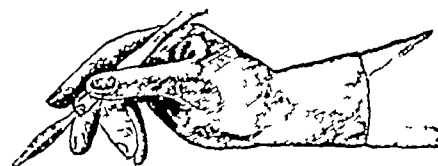
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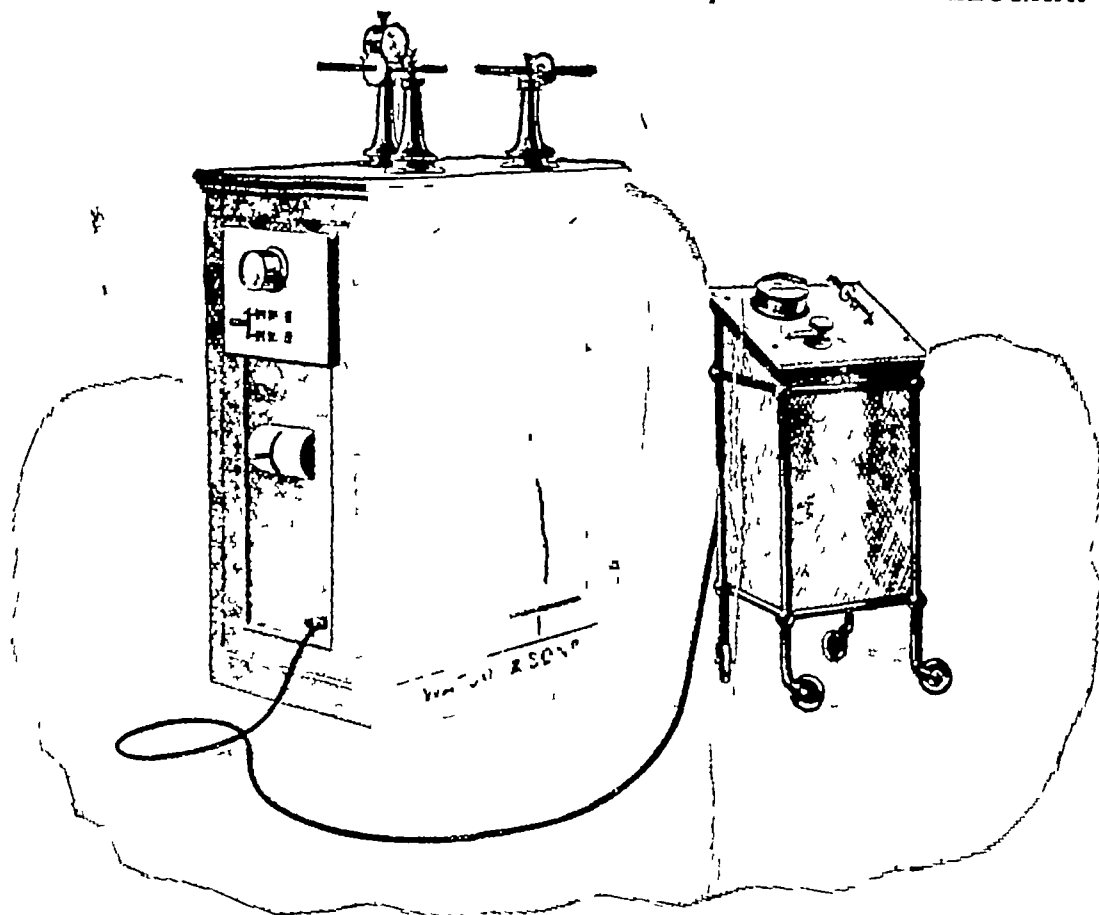
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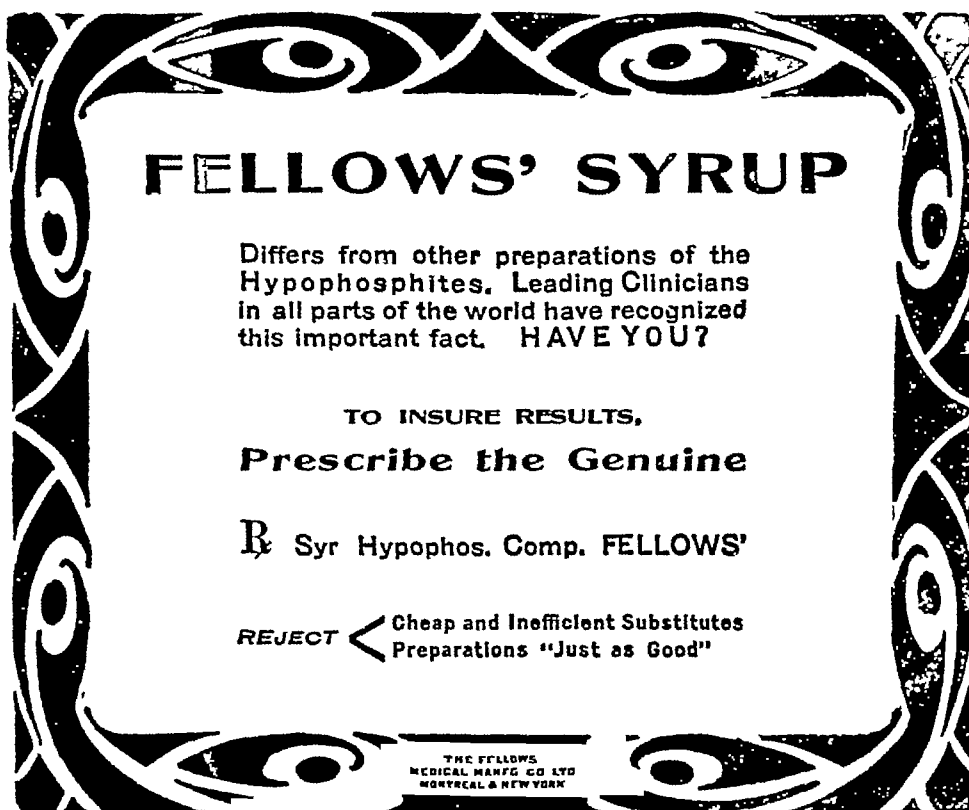
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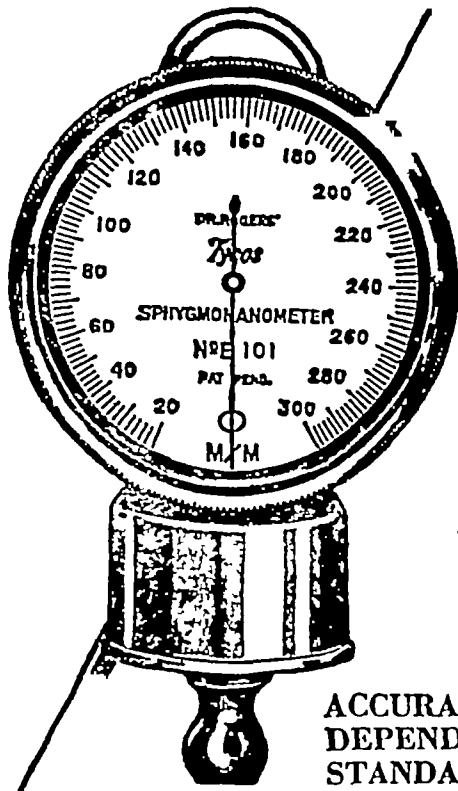
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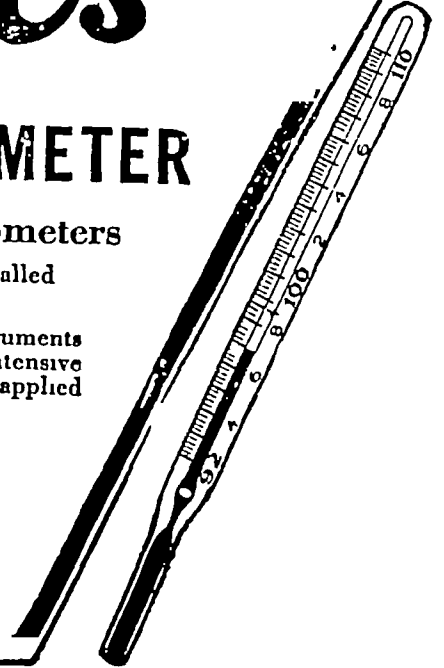
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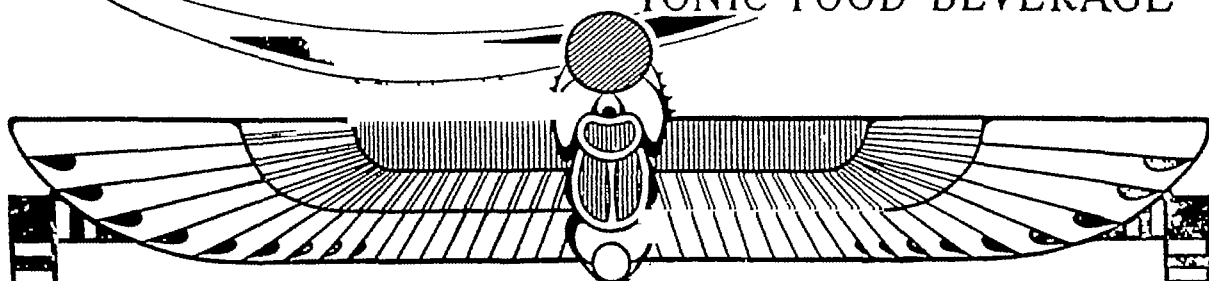
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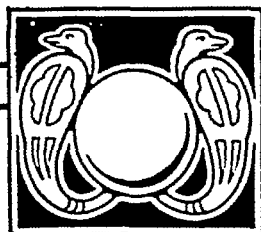
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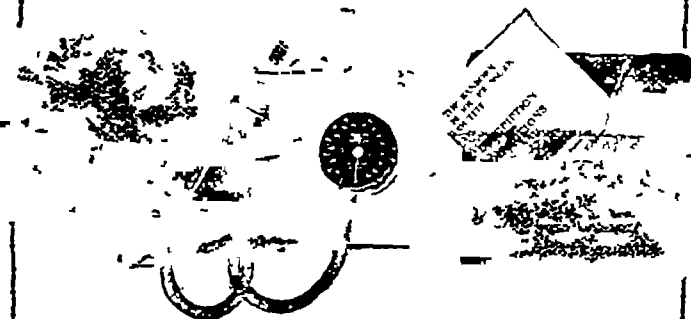
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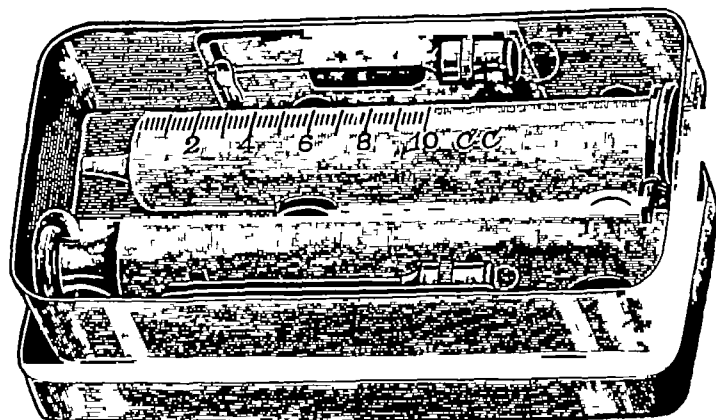
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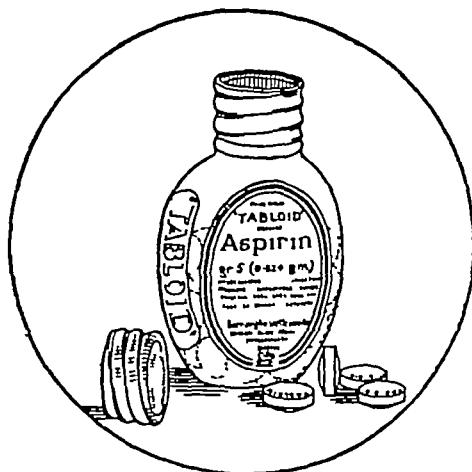
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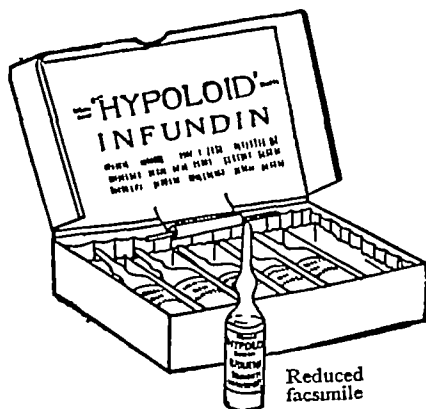
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Original Articles.

THE RESULT OF TRIALS OF SODIUM HYDNOCARPATE AND SODIUM MORRHUATE IN THIRTEEN INDIAN LEPER ASYLUMS

By DR. E. MUIR.

(Read before the Calcutta Leprosy Conference, February, 1920)

WITH a view to testing certain new forms of treatment in leprosy and determining which is the most effective and the best adapted to use in leper asylums in India the Rev Frank Oldrieve Secretary of the Leper Mission in India, arranged for the carrying out of an experiment in as many of the leper asylums as possible throughout India.

It was first proposed to test three different drugs viz chaulmoogra oil, sodium hydno-
carpate and sodium morrhuate. Owing to the painfulness of the first of these when injected, however it was decided to use only the latter two.

The chief difficulty in carrying out the experiment successfully was that in many leper asylums there are no qualified doctors, while in others the doctors were not accustomed to give either hypodermic or (what is much more difficult) intravenous injections. To remedy this as far as possible, several of the doctors in charge of leper asylums were sent to Kalna to undergo a special course of training. This lasted for only a few weeks in each case, but was sufficient to give a certain amount of practice in the giving of injections and the general principles of the treatment.

The experiment was carried out in a large number of the asylums and reports have been received from 13 of these. The reports received from two other asylums were so incomplete as to be of no use in determining the results.

Sir Leonard Rogers asked me to classify and report on the results as shown in the various reports.

The asylums where the experiment was carried out were the following (that is more or less complete reports were received from the following)—Dhamtari, C P, Manomadura Madras Presidency, Neyoor Travancore, Victoria C P, Raipur, Gava, Ambala, Almora Sarenga Venduruthy in Cochin State Davapuram, Kashmir, Vengurla.

In these thirteen places 183 patients were treated with sodium hydno-
carpate and 117 patients with sodium morrhuate.

Of those treated with sodium hydno-
carpate 111 were of the anæsthetic type 49 of the mixed type and 23 of the nodular type.

Of those treated with sodium morrhuate 68 were anæsthetic, 32 were mixed and 17 were nodular. I am not sure on what principle the patients were chosen for treatment, but it would look as if there were far more anæsthetic cases in the asylums than mixed and nodular cases combined. The duration of the disease in the cases treated varied from $\frac{1}{2}$ to 25 years. The period of treatment reported on varied from 2 months to a year. The result of examination of the nasal discharge was only mentioned in three of the reports and out of the 54 cases in these 3 asylums in which the nasal discharge was examined, lepra bacilli were found in 27, i.e. in 50 per cent. This is interesting from the point of view of infection. Lepra bacilli were found in the nasal discharge of 7 out of 26 anæsthetic cases examined, in 12 out of 16 mixed cases examined, and in 6 out of 8 nodular cases examined. That is 27 per cent in anæsthetic cases and 75 per cent in nodular and mixed cases.

Febrile and other reactions were recorded in only 8 out of the 13 reports. Out of 108 cases treated with sodium hydno-
carpate, reaction was positive in 31 cases. Out of 81 cases treated with sodium morrhuate, 18 reactions were recorded.

The dosage of both drugs varied from $\frac{1}{2}$ c.c. to 5 c.c. of a 3 per cent solution, beginning with the smaller dose and gradually increasing to the larger. Injections of hydno-
carpate were chiefly given intravenously and morrhuate hypodermically or intramuscularly and in some cases intravenously.

The results obtained with each of the drugs were divided into four columns (1) Worse (2) No improvement, (3) Slight improvement (4) Much improvement. Of the cases treated with hydno-
carpate the cases ranged themselves under the four columns in the following proportion 3, 48, 74, 58.

There was thus improvement in 132 cases or 72 per cent, and much improvement in 58 cases or about 32 per cent. In several of the cases the lesions entirely disappeared.

With sodium morrhuate no cases were recorded as worse, 33 were not improved 48 were slightly improved and 36 were much improved. Thus 71 per cent showed some measure of improvement of which 31 per cent showed much improvement. Thus percentage of both "slight improvement" recorded under both drugs is practically the same.

The opinion of most of those who carried out the experiment is that the best results are obtained in anæsthetic cases with sodium hydno-
carpate but that the veins soon become blocked and that sodium morrhuate has then to be resorted to as it can be given hypodermically and intramuscularly.

In nodular leprosy sodium morrhuate does not appear to be in any respect behind sodium hydno-
carpate and it has the advantage

Summarised statistics of leprosy treatment

Name of asylum.	No of cases treated with Sod hyd		No of cases treated with Sod morrh		Duration of disease	Length of treatment.	Lopra bac in nasal discharge	Reaction	Dose of Sod hyd	Dose of Sod morrh	RESULT								
	Sod hyd.		Sod morrh																
	Stationary	Slightly improved	Much improved	Worse							Stationary	Slightly improved	Much improved	Worse					
1 Dhamtari, O P	3	3	6	2	1	9	2-25 yrs	6 mons	Nil	1 to 5 cc	1 to 3 1/2 cc	1	2	3	4	2	3	Much improved	
2 Manomadura, Madras Presidency	19	3	5	27	16	4	3	23	1 to 3 1/2	1 to 4 cc.	1 to 1 1/2 cc.	7	9	11	2	10	11	Slightly improved	
3 Neyoor	9	12	1	22	2	1	3	6	1 to 3 1/2	1 to 4 cc	1 to 4 cc	2	13	7	3	3	—	Stationary	
4 Victoria, C P	4	—	4	3	1	—	—	—	1 to 4 cc	1 to 4 cc	1 to 2 cc	3	1	—	—	—	—	Much improved	
5 Raipur Mission Dispensary	—	—	—	—	1	1	2	2	Nil	Nil	8 to 20 min	—	—	—	1	1	—	Stationary	
6 Gaya (King Edward)	14	6	4	24	—	—	—	—	5 cc	5 cc	Nil	—	5	10	9	—	—	Worse	
7 Ambala	5	9	1	15	4	12	—	16	1 to 4 cc	1 to 2 cc	1 to 2 cc	—	6	7	2	3	8	5	
8 Almora	6	1	1	8	4	1	—	6	1 to 5 cc	1 to 2 cc	1 to 2 cc	—	3	5	—	1	5	—	
9 Sarenga	10	7	2	19	Part of the time with S M part with S G	4	—	6	1 to 1 cc	1 to 1 cc	Nil	—	—	9	10	—	—	—	
10 Venduruthy (Cochin State)	—	—	—	—	4	2	—	6	—	—	7-12 min	—	—	—	—	1	3	2	
11 Dayapuram	19	1	6	26	17	3	5	25	1 to 5 cc up to 5 cc	1 to 5 cc	1 to 5 cc.	12	5	9	—	6	6	13	
12 Kashmir	11	6	3	20	11	5	4	20	1 to 5 cc	1 to 5 cc	2 to 5 cc	3	8	2	12	6	2	—	
13 Vengurla	11	1	—	12	—	—	—	—	1 to 4 cc	1 to 4 cc	Nil	—	1	6	5	—	—	—	
TOTAL	111	49	3	183	68	32	17	117	1 to 5 cc	1 to 5 cc	1 to 5 cc	3	48	74	58	0	33	48	36
											A M N 17% 13% 27% 75% 75%								

it may be injected in small doses into the nodules where it acts locally on the bacilli, causing first a swelling of the nodule infiltrated and thereafter a shrinking and softening while the local lymphatics become temporarily red and swollen.

These results are in themselves encouraging, but there were several factors which contributed to their being worse than they might have been otherwise —

(1) In many of the asylums the cases are chiefly more or less advanced, while the best results are to be expected from early cases. In nerve cases which are far advanced the destruction of tissue and function is so severe that even if the whole of the lepra bacilli in the body could be exterminated, the patient would notice but little improvement in his condition as the destruction of the bacilli would not restore the motor, sensory and trophic functions of the nerves or restore the other lost tissues.

(2) The period of trial has not been long enough. The experiment only was recorded over a period of 2 months in some places which is not long enough to bring out the best results. In contrast with several, the results recorded by my late assistant Dr Binode Bihari Dutt, in cases treated by Dr Davies and himself at Sarenga, over a period of 6 months to 2 years, give an improvement of 100 per cent, of which 25 per cent are much improved.

(3) The treatment is difficult to carry out and most of those who carried out the experiments had but little experience and were unable to exhibit the drugs to the greatest advantage.

I should like to offer the following suggestions with regard to the successful carrying out of the treatment of leprosy —

(1) The result of this widely carried out experiment can leave but little doubt that a distinct advance has been made in the treatment of leprosy. It has shown the usefulness of both the drugs used and that instead of using one of them to the exclusion of the other, the one should be used to supplement the other.

(2) While it is too soon to say that a cure has been found for leprosy several cases are recorded where all the lesions have disappeared.

This is specially so in early cases. An effort should therefore be made to isolate hopeful cases from far-advanced hopeless cases.

The former might be treated in hospitals specially set apart for the purpose, and large enough to make it worth while to employ a full-time medical expert who while ensuring the very best treatment for these patients will be able to carry on research which will tend to improve the treatment. One such hospital or more than one might be constructed in each province. As the treatment in the majority

of cases would be lengthy, employment should be found for the patients, regulated to their capacity.

(3) The fact that lepra bacilli were found in the nasal discharge of 50 per cent of the cases reported on should in itself be sufficient to show the great need for revision of the Leper Act. Whatever danger there is of infection from ulcers and open sores, which constitute the legal leper at present, the danger from the nasal discharge, specially when the leper is suffering from a cold in the head, must be far greater. The rag on the ulcerating toe of the leper acts as a free pass on the railway it is true, but he is then more or less recognisable as a leper. But the leper who shows no such sores can mix freely with his fellow-passengers, who take no cognisance of this less recognisable mode of infection.

(4) Until suitable arrangements can be made for the treatment of less advanced cases of leprosy, every effort should be made to have the treatment introduced into the existing asylums. Where there are no suitable medical men to undertake the carrying out of the treatment an effort should be made to supply them, and where suitable medical men do exist, these should, where necessary, be further trained and encouraged to keep up to date in all improvements in treatment. Wherever the treatment is carried out the doctor should be trained in the use of the microscope if possible.

(5) With a view to bringing early cases as soon as possible under treatment every effort should be made through schools and the press to educate the public in the cause early symptoms, and the hopefulness of treatment in early cases and inducements should be created to undertake treatment.

NOTES ON A CASE OF "HYPOSPADIAS PERINEALIS"

By S CHELLIAH M.B. & C. (Madras),

Assistant Pathologist General Hospital, Colombo

THIS patient who will be shown presently to have had the anatomical characteristics of a man was brought up as a woman known by a feminine name Puchi Nona, lived to the age of 50 admitted into the Female Diarrhoea Ward of the General Hospital Colombo on 24th November 1919 with oedema of legs and breathlessness of 6 months' duration and died on 1st December 1919 of uræmia due to chronic parenchymatous nephritis.

(1) *General appearance*.—Big build large head broad face heavy limbs broad shoulders slight growth of hair on the chin and over the upper lip larger growth in the armpits slightly prominent pectoral mamma small conical nipples pyramidal growth of hair over the pubis, and deep and manly voice.

(2) *External Genitalia* —

(a) The penis is small imperfectly developed, looking not unlike a hypertrophied clitoris (pénis clitoridien), adherent on either side to the scrotal integument, with no meatus urinarius

(b) The scrotum is cleft, looking like the labia majora, the right half contains a testis, the left half is empty, the other testis was found in the left inguinal canal, together with a semi-solid blue mass close to it, of the shape and size of the testis, due to phlebectasis of the veins of the pampiniform plexus. This mass was punctured by accident

(c) The urethra—The lower wall of the urethra is defective, as far back as the perineum, and with the cleft scrotum, looks like the vulva. The sinus uro-genitalis thus presented is wide and deep, about an inch in length and opens directly into the bladder. The patient used to micturate in the squatting position

(3) *Postmortem examination*—The only pelvic organ was the bladder, the wall of which was thick, the mucous membrane, of slate colour and thrown into folds, due to repeated attacks of cystitis

The pelvis—The bones heavy, axes of the ilia oblique, iliac fossæ deep, inlet heart-shaped, symphysis pubis deep, public arch narrow and pointed—characteristics of male pelvis

(4) *Microscopical examination*—The genital glands shew the structure of the testis

(5) *Social condition*—The subject was not married, but lived with and was supported by his sister's son

(6) *Synonyms*—Hypospadias perinealis, hypospadias perineo-scrotalis, pseudo-hermaphroditus externus, pseudo-hermaphroditus masculinus externus

(7) *Statistics*—In 910 cases of pseudo-hermaphroditism collected by Neugebauer, there were 722 of the masculine variety and only 188 of the feminine variety, and 613 of the whole series were examples of pseudo-hermaphroditismus masculinus externus

(8) *Legal rights*—As very many of these cases, like the one cited above, are in reality of the male sex, doubtful cases should be brought up as boys. In three-quarters of the cases, the decision come to will prove to be correct, and the inconveniences which may result, if a mistake has been made are much less in the case of a supposed boy than in that of a supposed girl. It had happened that a hermaphrodite of male sex who had been rightly certified soon after birth as a boy had after a short time, on the erroneous diagnosis of a doctor, been corrected in the registry of births as a girl, and finally, on the decision higher authorities, with much trouble had his pro or civil rights. It is a well-

known fact that the correction of a mistake in the register of births causes a great deal of trouble

Tuffier and Lapointe are of opinion that in doubtful cases an incision is justifiable to determine the nature of the sexual gland, especially when it is situated in the inguinal region, and indeed they would go further and suggest, in view of the grave inconveniences that a wrong decision may cause, that an abdominal section for diagnostic purposes is even justifiable

When a medical man discovers in the course of an examination or an operation that an individual is not of the sex in which he had been brought up and is at the time assuming, the question as to whether he should divulge his knowledge or not is one of considerable difficulty. It must be remembered that many of these individuals are quite happy in their ignorance, and the grave inconveniences which may follow a change of sex on the part of an adult must be remembered. In cases where marriage is contemplated and the medical man is consulted on a question of doubtful sex an operation may certainly be recommended if necessary, to determine the points

(9) *Clinical significance*—It is very likely that the chronic parenchymatous nephritis, of which this patient died is of consecutive type due to an ascending infection, although the commonest form is suppurative nephritis or pyelo-nephritis

A CASE IN WHICH THE BLADDER WAS A CONTENT OF THE INGUINAL CANAL

By Y. V. CHABUKSWAR,

Crater, Aden

ADEN CIVIL HOSPITAL has the privilege of getting from the interior many Arabs suffering from hernia. Among 56 successful cases operated on by Doctor John C. Young, M.B., C.M., D.T.M., the Acting Civil Surgeon, the case under reference is of rare occurrence and of some interest to the profession. I therefore publish this case with the kind permission of the operator Doctor John C. Young, for which I am much thankful to him.

On 5th January, 1920, an Arab, aged 30 years, was admitted to this hospital, suffering from an impacted hernia, with the whole of the surface of the tumour covered with cautery marks. On the same day the patient was put under chloroform, and the hernia was cut down upon, and the sac was with great difficulty freed from its adhesions, tied, and removed in the usual way, then it was found that there was still another impacted hernia from which the first hernia has been dissected, this owing to the previous use of the

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cautery was so matted together that it was impossible to make out the different tissues, but the mass was dissected up to the middle line when it was found to be the bladder. The inner coat was then freed and tied by a purse-string suture, covered over by the freed muscular coat, and finally covered by the peritoneum and returned to the abdomen. The patient made an uneventful recovery and was discharged cured.

The interest in this case lies in there being a double hernia which came out of two different ruptures, yet was found matted together in practically an inseparable mass with the impossibility of recognising the bladder, because of the man having been cauterized several times by the Arab Hakims of the district to which he belonged. It is also a note of importance that about 95 per cent of the hernia cases were found previously cauterized. Branding appears to be the first and the foremost treatment for a pain, or for any swelling, in the hands of the Arab Hakims.

THE TREATMENT OF LEPROSY

By SIR LEONARD ROGERS, F.R.S.,

LIEUT.-COLONEL, I.M.S.

(Paper read before the Calcutta Leprosy Conference, February, 1920.)

WE have here to-day a unique gathering of superintendents of leper asylums and medical men and women with great experience of the treatment of the disease. Moreover, a number of valuable reports of the trial of recent improved methods of treatment have been received, which Dr E. Muir, at my request, has very kindly analysed and will report on. I am very glad he has been able to undertake this task, in spite of heavy work, as I preferred that it should be done by one who has great experience of the new treatments both in hospital and asylum practice and who can be relied on to give an unprejudiced opinion as he is not responsible for originating the methods. In opening the discussion to-day I propose to give a brief account of my investigations of the last four and a half years, to summarize the results I have so far obtained and to indicate certain further recent advances which give promise of greater results in the future. I desire in the first place to make it clear that my cases are mainly fairly early ones as will be seen from a reference to the figures in Table III only one-third being of over five years' duration, especially as compared with the advanced cases seen in leper asylums where a large proportion are nerve cases with loss of digits and other irreparable defects so that nothing like as good results can possibly be obtained under asylum conditions where even a small proportion of cases showing great improvement will still be far ahead of the results

obtained by earlier methods and will afford hope of more satisfactory results when our leper asylums can be converted more into leper colonies and hospitals to which earlier cases will be attracted by the prospect of receiving beneficial treatment with even some hope of ultimate cure.

Chaulmoogra oil and its derivatives—I need not go into the history of the use of chaulmoogra oil in leprosy, which has for long been known as our best remedy, although very few patients can take enough of this nauseating drug to derive more than temporary benefit from its use. An advance was made when Dr Heiser reported improved results in the Philippines from the intramuscular injections of the oil. Long before these results were published I had formed the opinion that the so-called gynocardic acid, consisting of the lower melting point unsaturated fatty acids, gave better results orally than the complete oil, and as early as 1912 I asked a well-known firm of manufacturing chemists if they could prepare a soluble compound of it suitable for hypodermic injection, but received a reply in the negative. In 1915 Dr Victor Heiser visited Calcutta and paid me the compliment of asking me to take up work at the subject. I then returned to the idea just mentioned and, with the help of Rai Chuni Lal Bose, Bahadur, Chemical Examiner at the Calcutta Medical College, and subsequently of Dr Sudhamoy Ghosh, who has worked for the last three years at chemical investigations under a grant kindly given by the Indian Research Fund Association, Simla, I have been able to prepare and test various chemical products of different varieties of chaulmoogra and hydnocarpus oils and latterly of other classes of oils. Thus I obtained sodium gynocardate, the sodium salt of the lower melting point fatty acids, and sodium gynocardate A, now more correctly called sodium hydnocarpate, from somewhat higher melting point acids, which are readily soluble and can be given subcutaneously. The sodium salt of chaulmoogra acid itself, with a still higher melting point, has not proved of much value in my hands. Subcutaneous and intramuscular injections of these salts proved of value in leprosy, but had the same disadvantage as chaulmoogra oil injections, although to a less extent, causing painful induration and being rather slowly absorbed. Further experiment showed that the new preparations could safely and advantageously be given intravenously, and more rapid improvement thus resulted, although the irritant effect of the drug on the vessel walls often caused inflammatory obliteration of some of the veins seriously limiting the use of this method.

Reactions in the leprosy tissues with destruction of the bacilli—The intravenous method, however, led to a most important

encouraging advance, for in certain cases, especially marked nodular ones, local inflammatory reactions, sometimes accompanied by fever, took place in the thickened cutaneous lesions and were followed by more rapid absorption of the diseased tissues. Still more striking was the fact that microscopical examinations proved that these local reactions were accompanied by active destruction of the innumerable bacilli in the lesions, which sometimes showed only a few remaining healthy-looking rod-shaped bacteria with large numbers of red granules of broken-up organisms. Moreover, repeated examinations of the lesions in nodular cases showing steady improvement without any inflammatory reactions, revealed similar changes until only a few granules of broken down bacilli remained which ultimately disappeared in favourable cases. I believe this is the first established instance of large numbers of highly resistant pathogenic bacilli being destroyed in the human body by the injection of substances not derived from cultures of the pathogenic bacilli themselves, a most encouraging fact. Very occasionally the febrile reactions may be severe and prolonged and accompanied by great debility, but I now have records of three advanced cases in which this was followed by extraordinary improvement without further active treatment. In one of these, the most extensive thickened patches on the face and back I have ever seen completely disappeared except for slightly pitted scar tissue. These local reactions with destruction of the lepra bacilli constitute a most striking advance and afforded the highest encouragement to me to continue my researches on the subject.

Summary of results obtained with sodium gynocardate and sodium hydnocarpate (sodium gynocardate A)—I recorded the results of treatment in 26 cases in the *Indian Journal of Medical Research*, of October, 1917, and of 14 more in the *Indian Medical Gazette* of May and June 1919, to which may be added 11 more recent cases, for the notes on which I am again indebted to my assistant, Dr Jogesh C Mukerji, making a total of 51. They may be conveniently summarized in Table I, classified according to the duration of the treatment, while the sodium morrhuate series, to be discussed presently, are also separately shown. The figures show 1 complete failure, 9 slightly improved, in only one of which was the treatment continued for over a year, 20 much improved, in only two of which was the treatment of over a year's duration, and 21 40 per cent, in whom the lesions completely disappeared. The bacteriological examination was negative in the 19 tubercular cases. Nine of the latter series were followed for upwards of a year, so the results of treatment is clearly a most

TABLE I

Results of treatment by sodium hydnocarpate and sodium morrhuate

Duration of treatment	Sodium hydnocarpate				Sodium morrhuate			
	Up to 6 months	6 to 12 months	Over 1 year	TOTAL	Up to 6 months	6 to 12 months	Over 1 year	TOTAL
Not improved			1	1				
Slightly improved	4	4	1	9	2	1		3
Much improved	8	10	2	20	9	3		12
Lesions disappeared	4	8	9	21	4	2		6
Total cases	16	22	13	51	14	6		20

TABLE II

After-results of sodium hydnocarpate and sodium morrhuate treatment

	Sodium hydnocarpate	Sodium morrhuate
Total cases	40	14
Not followed up	14	6
Followed up	26	8
Not improved	1	
Further improved	5	5
Lesions disappeared	5	
Remaining well	10	3
Relapsed	5	

TABLE III

Duration of the disease

Duration.	Under 1 yr	1 to 3 yrs	3 to 5 yrs	5 to 15 yrs	TOTAL
Number	7	23	5	16	51
Percentages	13.7	45.1	9.8	31.4	

Table II shows the after-results as far as the cases could be followed up, including 26 out of the 40 cases in the first two series already published, the remaining 11 being too recent for this purpose. It shows 1 complete failure, 5 cases showing further marked improvement, 5 in whom the lesions had disappeared as the result of further treatment, raising the figure in that class to 26 out of 40, or 65 per cent, a very satisfactory result, especially when it is considered that in 13 of the 40 cases, the disease was of from 5 to 15 years' duration. On the other hand, 5 cases relapsed to some extent, chiefly as a result of discontinuing the treatment too early against advice. Out of the 26 cases of the first two series which have been followed up for a considerable time, 10 remained free from all signs of the disease when last seen, including 6 who are still under observation. In 4 of the earlier series the lesions have now remained absent for over two and a half years, and in six of the second series for upwards of a year, which is highly encouraging, although I still do not think it advisable to speak of cures in view of the frequently long latent incubation

period of the disease and the recurring nature of tubercular disease due to a closely allied acid-fast bacillus

Summary of results obtained with sodium morrhuate—The proof I had obtained that the soluble preparations I had prepared from chaulmoogra oil exerted a definite destructive effect on the leprosy bacillus naturally led me to consider the even more important problem of any such action on the acid-fast bacillus of tubercular disease. The irritating local effect of sodium hydnocarpate and the possible danger of severe reactions in tubercle following its intravenous use led me to make, with the help of Dr Sudhamoy Ghose, a parallel preparation from codliver oil, which I named sodium morrhuate. I have already published a summary of a paper on its use in tuberculosis, and the full paper was sent for publication over a year ago to an Indian Quarterly Journal, and is really expected to appear shortly. This preparation was found to cause far less pain and induration locally than the hydnocarpate, while it also proved innocuous intravenously. It was, therefore, tried in leprosy and promising results were reported a year ago in 14 cases, since when 6 more have been treated, the results of the whole 20 cases being summarized in Table I. No case was treated for over one year and only 6 for beyond six months, yet 12 showed much improvement and in 5 the lesions disappeared, including a negative bacteriological examination in the 3 tubercular ones. On the other hand, 3 treated for only four to five months showed but slight improvement. The 3 cases in which the lesions had disappeared a year ago still remain clear, no relapse having taken place. For such a comparatively short trial these results are highly encouraging, while the slight degree of local pain after hypodermic injection, and the non-irritant effect of sodium morrhuate when injected into the veins, give it a great practical advantage over hydnocarpate solutions, which will make it more generally applicable in both asylum and out-door hospital practice.

Further progress resulting from recent researches—I at once recognized the crucial importance of my discovery that the acid-fast bacillus destroying power of derivatives from chaulmoogra oils (for I had also by this time showed that the hydnocarpus series of oils were even more active than true chaulmoogra oil) was in no way specific to that group, but was also possessed by an animal product, such as cod-liver oil. This newly discovered property therefore appears to reside in the unsaturated fatty acids as a class which opens up an endless field of investigation. This view has been further confirmed by the work of Dr K. K. Chatterji on neem oil to the investigation of which he adapted my process of making sodium gynocardate, and

reported promising results in various skin diseases, including two well marked cases of leprosy, from the use of the preparation he calls margosic acid.

Pursuing my own investigations, Dr Sudhamoy Ghosh has made for me sodium salts of the unsaturated fatty acids of linseed and soya bean oils. The former was suggested to me by Dr Caleb Davies, as he had found it of value in his practice internally in tuberculosis, but it proved to be very irritating subcutaneously and a short trial intravenously in two leprosy patients did not yield any reactions or other promising signs. Soya bean oil was selected on account of its high iodine value indicating that it contained a large proportion of the active unsaturated fatty acids—a new criterion which will doubtless prove of value in selecting other oils for investigation. The sodium salt made from soya bean oil proved to be far less irritating to the subcutaneous tissues and to the veins than hydnocarpace, while it also gave well marked local reactions in the lep-rotic tissues, sometimes with marked febrile reaction after subcutaneous injections of comparatively small and un-irritating doses, such as from one half to two c.c. In one case of extensive lep-rotic affection of the face, remarkable improvement has followed within three months of subcutaneous injections, together with disappearance of the acid-fast bacilli from the lesions. In other cases less rapid improvement has resulted, but, if further experience confirms the present promise, this drug is likely to prove a valuable addition to our armamentarium against leprosy, and possibly also against tubercle, and may ultimately replace the more irritating hydnocarpate of soda. The fact that such an active preparation has so easily been obtained by the application of the simple principle of selecting an oil with a high iodine value affords hope of further important advances through following up the clue which my researches have opened out, and clearly indicates the necessity of a whole time experienced worker to pursue this promising line of work now that I have to proceed to England on account of my health.

Ethyl esters of unsaturated fatty acids—Another line of investigation I have been pursuing during the past years is the preparation of chemical compounds of the active unsaturated fatty acids of chaulmoogra and other oils in a form which might prove to be more satisfactory for injection into the human system than the solutions of the sodium salts. Dr Sudhamoy Ghosh suggested to me for this purpose the employment of ethyl esters and made one of chaulmoogric acid which I tried subcutaneously in a few leprosy cases but found it to be too irritating to the tissues to be likely to prove of practical value and saw no good effects from such few injections.

as were given I therefore tried to prepare a similar product from codliver oil, and have recently been giving an ethyl ester morrhuate (which may conveniently be called ethyl morrhuate) in both leprosy and tuberculosis by the subcutaneous method with very little trouble to the patient and apparently distinctly favourable results, although much further experience will be necessary before the exact value of the new preparation can be decided. I have also found it innocuous given in a half c.c. dose of the undiluted oily looking liquid intravenously to a rabbit although this is equal to 15 c.c. of the 3 per cent solution of sodium morrhuate. In this connection it is of interest to note that Hollmann and Dean reported in June 1919 encouraging results with subcutaneous injections of ethyl esters of different fatty acid fractions of chaulmoogric oil after much longer trials than my independent ones referred to above. Dr K. K. Chatterji has also reported favourably on the use of ethyl ester margosate in a variety of diseases, including two cases of leprosy. The field of enquiry now opened out is truly a very wide one and with more workers we need not despair even of finding an actual cure for leprosy, and I am sanguine enough to believe also of tuberculosis, which I hope before long to have more favourable opportunities for working at.

A REPORT ON THE GYNOCARDATE AND MORRHUATE TREATMENT OF LEPROSY BASED ON FORTY CASES TREATED IN THE KASHMIR STATE LEPROSY HOSPITAL

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(Read before the Calcutta Leprosy Conference, February, 1920)

We owe the introduction of chaulmoogra oil for the treatment of leprosy to Le Page of Calcutta. It was favourably reported on by Bevan Rake, who mentions a case in which $\frac{3}{4}$ to $1\frac{1}{4}$ drachms were administered internally daily for six years with great benefit. He also recorded 18 cases in which under this treatment, he noted improvement of sensation and diminution of tubercles. For in 1890, reported a case in which, between 1884 and 1890, a leper treated with this oil had completely recovered. Rennie and Carter also observed marked improvement after internal administration of chaulmoogra oil (1). In India, systematic treatment was carried on in Madras with oil pressed from the seeds of *Gynocardia odorata* (*Hydnocarpus odoratus*) 2 gms. of which were given twice daily in an ounce of milk, and it was claimed that

anæsthesia cleared up and the skin became smoother (2).

In 1913 four cases were reported in the United States of America as having been apparently cured by chaulmoogra oil treatment. In two of these, the remedy had been used hypodermically. Victor Heiser, Director of Health for Philippine Islands, then tried a filtered mixture of chaulmoogra oil, camphorated oil and resorcin, 4 grams of the latter and 60 c.c. of each of the two former. This was given hypodermically in 1 c.c. doses, gradually increasing at weekly intervals. He treated 12 cases, some of them for 2 years, and in some cases doses of from 5 to 10 c.c. were ultimately reached. He claimed improvement in every case, and in 55 per cent practical cure (3).

Encouraged by Heiser's apparent success, Sir Leonard Rogers, who had previously obtained good results by oral administration of large doses of gynocardic acid, now determined to try the intravenous use of soluble sodium gynocardate. After obtaining the assistance of Dr Sudhamoy Ghosh in the investigation of the hydnocarpus fatty acids and their melting points, Sir Leonard Rogers decided to limit his trials to the *Tarantogenos kurzii*, and he had a solution made of the sodium salts of mixed hot and cold pressed oil of a strength of 3 per cent, one gram of the salts being present in 2 c.c. of the sterilized carbolyzed solution.

In October 1917 Sir Leonard Rogers published details of 26 cases injected with sodium gynocardate and chaulmoograte. While all his cases shewed some improvement, those subjected to treatment for upwards of a year gave the best results. Indeed 8 out of 12 are classed as lesions disappeared (4).

In June 1918 Muir, of Kulna, published a report on 30 lepers treated with this solution, and in April 1919 he brought the record up to date and added notes of 23 other cases. He records rapid improvement in many of his cases, especially in early cases and children.

(5) Sodium morrhuate, prepared from cod-liver oil, we also owe to Sir Leonard Rogers. It has one great advantage over the gynocardate, for it can be used subcutaneously. Twice a week a dose of $\frac{1}{2}$ c.c. is given and gradually increased by $\frac{1}{4}$ c.c. until 4 c.c. is reached. The large doses may be given only once a week. Sir Leonard Rogers has recorded several cases which shewed marked improvement under this treatment (6).

In 1919 we selected forty cases of nodular or anæsthetic leprosy. Those who were debilitated were excluded. Twenty were treated with intravenous injections of gynocardate and twenty with subcutaneous or intramuscular injections of morrhuate of sodium.

The following table gives a brief statement of the cases and the results obtained —

went home in August 1919 All the red thickened patches of arms, back, thighs and

Table of twenty cases treated with intravenous injections of gynocardate

No	Type	Duration of disease	Duration of treatment	Mode of injection	Number of injections	Maximum dose	RESULT
1	Tuberc.	5 years	7 months	Intravenous	52	3½ c c	Not improved
2	Do	3 "	7 "	Do	38	4½	Improved
3	Do	5 "	3 "	Do	12	4½	Much improved
4	Do	2½ "	6 "	Do	37	5	Fresh manifestations
5	Do	9 "	5 weeks	Do	10	2 c c	Not improved
6	Do	5 "	9 months	Do	52	5	Much improved
7	Do	7 "	8 "	Do	56	5	Improved
8	Do	17 "	5 "	Do	39	4½	" "
9	Anæsth	3 "	7 "	Do	55	5	Not improved
10	Do	2 "	6 "	Do	41	4½	Slight improvement
11	Do	4 "	6 "	Do	42	5	" "
12	Do	4 "	6 "	Do	39	4½	" "
13	Do	5 "	2 "	Do	10	2	Died
14	Do	8 "	5 "	Do	20	2½	Fresh manifestations
15	Do	6 "	3 "	Do	27	3	Not improved
16	Do	6½ "	6 "	Do	45	4½	" "
17	Do	7 "	7 "	Do	52	5	" "
18	Do	7 "	7 "	Do	53	5	" "
19	Do	10 "	7 "	Do	52	5 c.c	" "
20	Do	12 "	7 "	Do	48	4½	Slight improvement

Commencing with 1 c c twice weekly, the method has been gradually to increase till the large doses are reached and then to administer it once a week

It will be seen that our cases are very chronic and most of them, it may be added, are very severe. The milder cases do not care to come to a hospital where there are so many bad cases

Each case was photographed at the beginning of the special treatment. In estimating improvement a careful comparison is made with the print

The following are illustrative cases

No 6 Sadiq Joo—æet 42, Face red nodulated. Ears thickened, macular eruption on hands arms back thighs and legs. Outer sides of both thighs and legs anæsthetic. No muscular atrophy of hands. No ulceration hands or feet. ulceration nasal cavities. Acid-fast bacilli in nasal discharge and thickened patches of skin. 25 injections twice weekly and 27 once a week. Result excellent. Great improvement. All the macular eruption has disappeared. Red areas have now normal colour. Sensation has returned in the anæsthetic areas. Still ulceration of nasal cavity

Case 8—Baz Gul—æet 33—A bad case. Nodular thickening cheeks and forehead. Ulceration outer sides of thighs legs and elbows with anæsthesia. Nasal cartilage ulcerated and nose flattened. Some muscular atrophy of hands, and right thumb and two fingers and left fourth and fifth fingers have lost terminal phalanges. Red thickened patches on back. Acid-fast bacilli in nasal discharge and thickened patches. Treatment begun January 30 1919. He had 39 injections. The veins were then so shrunken that further intravenous dosage was stopped. The patient

legs had disappeared, ulcers of thigh better. Nasal cavity and palate in same condition

No 9 Mahammed Mir, æet 33—Anæsthesia buttocks and both thighs, legs and feet. Ulceration both great toes. No thickening of skin or ulceration nasal cavities. Fifty-five intravenous injections were given. He had a slight temperature reaction the first day

Result No improvement in sensation, chronic ulcers healed but fresh ulceration of right first and second toes

Fresh manifestations of the disease while under treatment—No 9 is a case in point. Another case No 4, had 36 intravenous injections of which 26 were twice a week and 10 once a week. After six months he left hospital with no improvement. He returned on September 12th, and 11 more doses were given of which nine were 5 c c

Result He has many fresh nodules on forearms and legs and a few fresh nodules on face. The old nodules are somewhat smaller

In case 14 20 injections were given. They were not well borne and there was a tendency to fresh ulceration

Case 13 died of laryngeal and bronchial complications. His treatment commenced on January 31st 1909-10. Only 10 intravenous were given. He had slight temperature reactions to 99.4. On March 5th 1919, acute dyspnoea set in for which tracheotomy was performed. Injections were stopped. He died 25 days later from bronchitis. In this case I regarded the disease as progressive in spite of treatment. Respiratory complications have always been one of the chief causes of mortality in leprosy

In cases in which there is laryngeal leprosy it is safer to give small doses and to reduce or stop them if there is any local reaction. Where the eye is involved, extreme

required In case No 1 thirty-two doses were given After he had been some months under treatment, he started acute iritis Another case No 16, had 45 injections There was some diminution in sight due possibly to toxic amblyopia, which improved when the injections were stopped I do not think he was malingering

To sum up, about half the cases treated shewed distinct signs of improvement Seeing that this is so, it is curious that so many of the others failed to respond in the same way Of course, to some extent in these cases of some years' standing the conditions of cure have ceased to exist Deformities, the loss of fingers and toes, contractures, muscular atrophy, deposits of fibrous tissue causing pressure atrophy of neurones and cicatrices cannot be expected to clear up For this reason it would appear that nodular cases have benefited more than those of old standing anæsthetic leprosy

The tendency in all cases to obliterative phlebitis in the vicinity of the injections is constant As this interferes with continued treatment over sufficiently long periods, it is best, when the intravenous injections are impossible, to go on with the two-grain pills or tablets of gynocardate, thrice a day, after meals, increasing the doses to tolerance

The following is a table of twenty cases treated by intramuscular injections of morrhuate of sodium

No	Type	Duration of disease.	Duration of treatment	Number of injections	Maximum dose	Result
1	Anæsth	6 yrs.	5 ms	20	2 c c	Slight improve ment
2	Tuberc	3 "	7 "	38	2½	Do
3	Do	7 "	7 "	41	2½	Not improved
4	Mixed	2 "	6 "	28	2½	Died
5	Tuberc	7 "	5 "	21	2	Not improved
6	Mixed	4 "	7 "	44	2½	Much improved
7	Do	8 "	4 "	23	2	Do
8	Anæsth	3 "	7 "	46	2½	Not improved
9	Mixed	18 "	7 "	40	2½	Slight improve ment.
10	Anæsth	7 "	7 "	46	2½	Fresh manifes tations
11	Do	5 "	7 "	36	2½	Not improved
12	Do	1 "	7 "	41	1	Improved
13	Tuberc	10 "	2½ "	10	1½	Died
14	Anæsth	6 "	7 "	46	2½	Not improved
15	Do	5 "	7 "	46	2½	Slight improve ment
16	Do	9 "	6 "	31	2½	Not improved
17	Do	16 "	7 "	39	2½	Fresh manifes tations
18	Do	6 "	6 "	21	2	Not improved
19	Do	12 "	7 "	44	2½ c c	Do
20	Do	12 "	7 "	47	2½	Improved

In determining result, each case was photographed and compared with the original print from time to time

Some typical cases from the above table follow in detail—Case 6 Mahodou, aet 40, face, arms, back buttocks, thighs and legs nodulated, left heel cracked, knees ulcerated, feet anæsthetic Fourth toe left foot ulcerated

Doses of ½ c c gradually increased to 2½ c c 44 injections

Result—The tubercles of his face, back buttocks, thighs and legs have disappeared, leaving rough red spots Ulcers healed Much improvement Case 7, Kulsum Bi, aet 39 Face red and tuberculated Macular eruption both arms, left hand thighs and legs Anæsthesia forearms, outer side of legs and both feet Ulcer palate Acid-fast bacilli in nodules and thickened patches of skin After 4 months' treatment she left the hospital Twenty-three injections had been given from ½ c c to 2 c c Her macular eruption was much better Redness of face had subsided, but anæsthesia was not appreciably less

Case 9, Ramzan Bat, aet 20 Anæsthesia right forearm and both thighs, ulcer palate and right nasal cavity Nose flattened, small patches of cicatrix on elbows and knees Acid-fast bacilli in nasal discharge, 46 injections No fresh manifestations Still anæsthesia and ulcer nasal cavity

Case 14, Amad Lon, aet 37 Facial paralysis Macular eruption neck, both arms, thighs and legs Ulcers both elbows, both legs Anæsthesia outer side of both thighs and below knees Loss of several digital terminal phalanges and ulcers Acid-fast bacilli in thickened patches

Twenty intravenous injections were given He started painful swellings all over the body and the treatment had to be discontinued

This case points to over-action of the remedy with dissemination of toxins Case 17 is similar

Case 17, Lassa Lon, aet 29 Face paralysed, skin over elbows thickened Macular eruption both legs with anæsthesia Hands and feet mutilated and both feet ulcerated Thickened patches of skin contain acid-fast bacilli Thirty-nine injections were given running up to 2½ c c on September 28th, 1919 after an injection his temperature reached 102.2 and some fresh eruption appeared on the thighs A fresh ulcer appeared on the right elbow

In such cases the treatment must be temporarily stopped and recommenced after a time with smaller dosage under careful observation

Two cases in the above table died No 4, Rahman Lon, had 28 injections After the last, on July 18th, he had a sharp reaction and some painful oedematous swellings all over the body, so the treatment was discontinued He died on August 22nd, from heart disease and bronchitis Case 13, Khali, aet 20 Face, ears, lips and chin nodulated, throat ulcerated, had tracheotomy done for nodular laryngeal stenosis Both arms nodulated and ulcerated, also thighs, buttocks and legs Both nasal cavities ulcerated Acid-fast bacilli in nasal discharge and nodules This was a case of the worst type Ten

injections were given, beginning with $\frac{1}{4}$ c c. She had febrile reaction and painful local exacerbations, so the treatment was stopped after $2\frac{1}{2}$ months. She died about $3\frac{1}{2}$ months later from pulmonary extension of the disease.

The general results of the two methods of treatment may be tabulated as follows —

<i>Gynocardate treatment</i>					
Much improved	2	Improved	7	Not improved	11
Percentage	10		35		55

<i>Morrhuate treatment</i>					
Much improved	2	Improved	6	Not improved	12
Percentage	10		30		60

Most of the cases are very chronic, and they have been under treatment for less than a year, so the results may be considered as encouraging. Many of the patients are most unwilling to undergo continued treatment with injections. The gynocardate pills are likely to be specially useful in those cases in which for any reason the treatment is interrupted and also as a supplement to the intravenous injection.

CONCLUSIONS

1. On an average treatment of 6 months, about half the cases appear to derive benefit from the gynocardate and morrhuate treatment.

2. Those not definitely improved appear to remain stationary. Only about 10 per cent show fresh manifestations of disease while under treatment, some of which have been due to the freeing of toxins by over-action of the drug.

3. Laryngeal and ocular leprosy require great caution in the exhibition of these remedies.

The lepers of India and those interested in their welfare owe a debt of gratitude to Sir Leonard Rogers, for introducing these remedies, and to the Rev F Oldrieve, through whose humanitarian efforts the needs of lepers have been made widely known and facilities for the use of these remedies have been afforded.

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SODIUM MORRHUATE IN TUBERCULOSIS

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The following is a report on the investigation on tubercular cases admitted in the 33rd I.G.H. during the Afghan War.

When I took over charge of the isolation block in August 1919, there were about a dozen cases of T.B. lungs recently admitted. Out of these six cases were selected for sanitarium treatment in Bhowali. Case sheets with temperature records of these cases were sent to Bhowali for approval, but a note was received to the effect that the sanitarium would be closed during the winter. I had to take up these cases and all other cases which were subsequently admitted in the 33rd I.G.H., and commenced sodium morrhuate treatment. A month later Lt-Col D.W. Sutherland, C.R.E., I.M.S., Consulting Physician to the W.F.F., inspected these cases and approved of the investigation as within that short time favourable results were already noticed in some cases.

The favourable reports about sodium morrhuate treatment in various tubercular diseases were recorded in the *B.M.J.* February 8th, 1919. I beg to acknowledge my grateful thanks to Captain D.G. Cooper, I.M.S., and Lt-Col I.M. Macrae, O.B.E., I.M.S., for the great encouragement given to me during this investigation. In fact, Captain Cooper, I.M.S. first suggested sodium morrhuate treatment in leprosy cases, before I took over charge of the isolation block. My thanks are also due to S.A. Surgeon Dewan Chand for his conscientious work and able assistance during this investigation.

NUMBER AND NATURE OF T.B. CASES

Up to the date of the report, the following cases were treated —

I	T.B. Lungs—early	4
II	T.B. Lungs—advanced	28
III	Tubercular diarrhoea with enlarged mesenteric glands	1
IV	Scrofulous glands	1
V	Lupus vulgaris	2
VI	Lupus erythematosus	1
Total		37

I. T.B. Lungs—early cases

Four patients were received whose lesions in the lungs were not far advanced out of these two cases never showed T.B. in their sputum. The diagnosis however was in one case confirmed by Col Sutherland, I.M.S. Physical signs in the lungs and symptoms gradually disappeared under sodium morrhuate treatment, even before the full doses were arrived at and these patients were ultimately cured and discharged by a medical board.

The remaining two cases showed T.B. once in their sputum after repeated examinations. It was however noticed that they quickly disappeared within a week. The sudden appearance of T.B. in such vast numbers and their equally quick disappearance are rather interesting features in these cases. These patients never showed T.B. again in their sputum. They gained weight and their physical symptoms improved.

disappeared in one case and slight pleuritic thickening only is manifest in the other. The former will be put up before the next medical board for discharge.

II *T B Lungs—advanced*

I 28 advanced cases were treated with intravenous injections of sodium morrhuate. T B was positive in sputum of all these cases. Out of these, two were very advanced and died within six weeks after admission, so that only two or three injections could be possibly given in these cases. Out of the remaining 26 cases—

(1) Eight cases were cured and discharged by a medical board.

(2) Ten cases are improving, out of which six will be fit for discharge within a week.

(3) Three cases are in a stationary condition.

(4) Four cases are steadily losing weight.

(5) One patient died.

Notes on advanced cases of T B Lungs

II (1) Out of 8 patients cured and discharged, 4 patients had normal temperature since the time of admission. One was a convalescent pneumonia patient in whose sputum T B were found. 3 were active febrile cases and gradually yielded to sodium morrhuate treatment.

One of these patients named Proman Singh developed signs of delusional insanity, and also got a complication in the shape of peripheral neuritis. This patient was also suffering from malaria of malignant tertian type, which only yielded to repeated intramuscular injections of quinine. This patient steadily recovered and all the complications had disappeared before he was discharged.

(2) Ten patients, who are still under treatment, are progressing favourably. Out of these, 6 are practically cured and are expected to be fit for discharge within a fortnight. 4 patients are still showing T B in their sputum. In 2 cases, T B show a beaded appearance and are in the process of disintegration. Two remaining cases have not yet received maximum doses, but all of them are steadily gaining in weight and are making uninterrupted progress.

One patient named Siri Ram had an attack of enteric fever (Widal's test being positive) before his sputum showed T B. He was getting fever for months and was stone-deaf when he was transferred to Quetta from E P C. Weber's test was negative in his case. The deafness was supposed to be due to tubercular pachymeningitis. The patient's temperature gradually came down and his deafness was completely cured. This result was to be entirely attributed to sodium morrhuate treatment.

(3) The condition of 3 patients is stationary. They were all running a tempera-

ture when they were admitted. Their temperatures have come down to normal as a result of sodium morrhuate treatment, but their weights are practically stationary. T B are still present in their sputum. Lately however 2 of them have shown slight signs of improvement.

(4) There are 4 cases who are steadily losing weight, 3 of them were febrile and one was afebrile. All of them were very advanced cases of P P and full doses could not be given as the dose of sodium morrhuate can only be increased very cautiously in febrile cases. Two cases were only taken up recently. The prognosis of both these cases is still uncertain, the condition of one case is almost hopeless as he has developed myocarditis.

The failure of this treatment in one case is not explicable as the patient had all along normal temperature and his physical signs were not worse than those detected at the time of his admission. But T B was persistently present in his sputum and he slowly and steadily lost in weight. Lately he became very much depressed and lost all hope of recovery, so he was boarded and discharged from the hospital.

(5) One patient died. Fever was persistent in his case, and T B was always present. This man slowly and steadily declined in health and just a few days before his death developed signs of insanity.

III *Tubercular diarrhoea with enlarged mesenteric glands*

One case was received from the dysentery block. The effect of injection of sodium morrhuate is not yet perceptible. The gland has become softer in consistency, but although diarrhoea stopped after three injections, it has relapsed. The weight is almost stationary. The patient also suffered from persistent emesis for nearly 2 months. There has been no vomiting for a month. His lungs are also affected, for T B was found in his sputum after repeated examination.

IV *Scrofulous glands*

One man with inoperable scrofulous glands was given a trial. No reaction was observed in his case, but pain and tenderness disappeared after three injections. This man ceased to attend after the 5th injection a fortnight ago. The O C of his regiment (14 G R) was informed but the man has not turned up till the date of this report.

V *Tubercular skin diseases*

Three cases were taken up for investigation.

In two cases of lupus vulgaris, the result was very satisfactory. One of these patients had extensive affection of neck, armpit, hands,

etc., with warty growths. Both these patients are now almost cured.

Sodium morrhuate had, however, no effect on a case of lupus erythematosus on which it was given trial. This man is now getting combined sodium morrhuate and X-ray treatment with some improvement.

GENERAL REMARKS

The value of sodium morrhuate treatment in T B lungs is undoubted.

Effect—The remarkable factors are the steady increase in weight of patients in spite of pyrexia, and gradual diminution of expectoration.

Reaction—Reaction was marked usually in active febrile cases, being severer in more advanced cases. It was noted that the reaction, if any, was most marked on the 3rd or 4th day. In some cases, however, reaction was marked on the 1st or 2nd day. In the majority of the afebrile cases there has been no reaction at all, and these patients rapidly improved under this treatment.

Mode of administration—It was noted that in cases where intravenous injections were given, the results were far more satisfactory than those obtained by the subcutaneous method.

Dose—Sir L. Rogers' directions were strictly followed, *viz.*, beginning with $\frac{1}{2}$ c c. of 3 per cent solution gradually increased by $\frac{1}{4}$ c c. once or twice a week up to 2 c c. after which doses were increased by $\frac{1}{2}$ c c. weekly till the maximum of 4 c c. had been reached. In febrile cases the dose had to be increased very cautiously and the intervals were greater, generally the next dose was given when the reactionary temperature began to fall down.

Action—I have noticed two kinds of action of sodium morrhuate on tubercular cases. Besides bacteriolytic action as shown first by beading and then disappearance of T B from the sputum, there is undoubtedly some fibrolytic action marked in cases where sodium morrhuate had been tried. My conclusion has been derived from the following facts—

(1) It was noted that in two early cases of T B lungs there was a sudden appearance of vast numbers of T B and these quickly disappeared again. The explanation may be that sodium morrhuate attacked the fibrous wall of some tubercular focus and allowed the T B to appear in vast numbers. Their quick disappearance can be explained by its bacteriolytic action on devitalised germs, so long confined within the focus.

(2) The remarkable action on the basal pachymeningitis of a patient who was cured of his deafness by this treatment only is probably due to fibrolytic action.

(3) In the case of lupus vulgaris with extensive affection of the neck, the patient

could hardly move his neck. This man can now easily turn his head in every direction.

Advantages over "tuberculin treatment"

(1) Tuberculin can only be tried on selected cases. One of the conditions is that the patient should be free from fever or run low temperatures. Sodium morrhuate can be tried, though cautiously, in all febrile cases. It has been noted that it brings down the temperature gradually.

(2) Tuberculin favours the formation of a ring of fibrous tissue mainly by attenuating the virus, as shown by the gradual increase of the opsonic index, the result may be that tuberculin treatment favours the formation of a fibrous ring round the tubercular foci before the bacilli are actually killed. The formation of these fibrous rings stops the progress of the disease and makes the foci inert. But these foci always remain potentially dangerous, especially when the antitoxin excited by injection of tuberculin has been excreted out of the system. The effect of sodium morrhuate, in my opinion, should be more permanent for, in addition to its direct bacteriolytic action, it prevents the formation of fibrous rings surrounding the foci. It is quite possible that it may do harm in quiescent cases, by dissolving the fibrous rings and letting loose the T B lying within these rings.

(3) The rapid increase in weight even in febrile cases compares favourably with that noticed by tuberculin treatment.

Combined treatment

Trial should be given to the combined treatment by sodium morrhuate and tuberculin, especially in those afebrile cases in which no improvement is noticed by sodium morrhuate treatment alone. It is to be noted that in all my cases inhalations of creosote and nascent iodine were carried out as a routine measure.

Quetta as a sanitarium

The favourable result in my cases is also attributable to the splendid dry climate of Quetta,—it is remarkably free from dust unlike other places in Baluchistan. Even in the winter season patients continued to improve as they did before its onset.

Sodium hydriocarpate A

It was noted in at least three of my cases that where sodium morrhuate failed to reduce the temperature sodium hydriocarpate succeeded. This was noted when for a short time sodium morrhuate was out of stock and I had to give trial to sodium hydriocarpate with the permission of my chief Col. McCreary, M.S., because both T B and lepro bacilli are acid-fast organisms and it was hoped that sodium hydriocarpate which was effective in leprosy could be also effective in treatment of T B.

outside of the right foot The patient's general health has much improved

Result—Lesions very markedly improved

Condition, May, 1919

Complete disappearance of all lesions

This is a remarkable case in that the lesions and symptoms have so completely and rapidly disappeared

Bacteriological examination of nose—Negative

Case IX

Condition, October 1917

Patient has had leprosy for 20 years, and has been in prison for 1 year

There are two large pale maculæ covering a large part of both thighs, and extending down below the knee-joints There are pale-coloured maculæ on chest, face and both arms Retraction of left hand

Complete anæsthesia of all maculæ Anæsthesia of both hands, legs and feet

Diagnosis—Maculo-anæsthetic leprosy

Condition, April 1918

After 7 months' treatment

Maculæ have markedly returned towards normal skin colour though those on thighs are still quite evident

No anæsthesia of body, face or hands but partial anæsthesia, i.e., can feel pinching, but not stroking where formerly he could not feel the prick of a pin—still remains from the thigh to the feet

Result—Considerably improved

Condition, September 1919

Remaining partial anæsthesia of left foot Upper border of large pale maculæ, still observable in right thigh, otherwise, all symptoms have disappeared

Result—Very markedly improved

Bacteriological examination of nose—Negative

Case X disappeared

Case XI disappeared

Case XII

Condition, November 1917

He has been in prison for 1 year, and has had leprosy for 2 years

He has disseminated tubercles on his face, arms and body Anæsthesia of left foot and ring finger of left hand

Diagnosis—Mixed leprosy

Condition, April 1918

The tubercles have completely disappeared from the body, a few still remain on the arms and face, the latter being markedly reduced in size

Anæsthesia has completely disappeared

Result—Considerable improvement

Condition, September 1919

Slight anæsthesia is remaining on left foot, tubercles on face have entirely disappeared, leaving small red patches which are just visible

Result—Great improvement

Bacteriological examination of nose—Negative

Case XIII

Condition, February 1918

Patient has been in prison for 5 years and has only had leprosy for 2 years, therefore it appears as if he were infected in prison

He has small red maculæ on both cheeks, on thorax and abdomen, which are very slightly anæsthetic

There is complete anæsthesia of 4th toe of right foot

Diagnosis—Maculo-anæsthetic leprosy

Condition, June 1918

The maculæ have entirely disappeared, and the only remaining symptom is the anæsthesia of 4th toe, which now is only partial, i.e., he can feel when the skin is pinched

Result—Marked improvement

Condition, September 1919

All clinical symptoms have disappeared, except one small spot of anæsthesia $\frac{1}{2}$ in diameter on front of tibia at the fraction of middle and lower thirds

Result—Very great improvement

Bacteriological examination of nose—Negative

Case XIV

Condition, May 1918

He has had leprosy for 6 years and has been in prison for 6 months

There are dark red maculæ of varying sizes on face, chest, both arms buttock, abdomen, back and both thighs These have distinctly raised margins Anæsthesia on face, arms and feet

Diagnosis—Maculo-anæsthetic leprosy

Bacteriological examination of nose—Negative

Condition during reaction

The reaction first appeared in the month of June 1918 All the maculæ became much redder, thicker and margins more raised The patient felt itching of the maculæ Complete hyper-anæsthesia over all the macular areas, but without fever

Reaction lasted for 1 month and slowly disappeared

Condition, September 1919

All clinical symptoms have disappeared except an area of anæsthesia of left outer calf, size 2 in by 3 in

Result—Very marked improvement

Bacteriological examination of nose—Negative

Case XV

Condition, July 1918

He has had leprosy for a long period before entering prison He commenced treatment at once on admission to the prison

His skin is very rough and thick. There are tubercles on the posterior surface of the left ear. Maculæ on his face are of dark red colour. A large part of both thighs covered with pale maculæ extending down below the knee-joints. All finger and toes are swollen. Crooked nails. Slight anæsthesia of all parts of the body.

Diagnosis—Mixed leprosy

Bacteriological examination of nose—Negative

Condition, May 1919

All tubercles and maculæ disappeared. The thickened skin all over the body has become soft. Sensation returned to normal. Swelling of fingers and toes disappeared. The nails are still crooked.

Result—All clinical symptoms of leprosy have disappeared.

Bacteriological examination of nose—Negative

Case XVI

Condition, August, 1918

The patient has had leprosy for 7 years before coming under treatment by sodium gynocardate "A."

There are red maculæ on his face between eyebrows, on both cheeks, chin and the left side of the nose. The lobes of both ears are thicker than normal. There are maculæ on his chest, abdomen, back, arms and legs. These maculæ have raised margins. Anæsthesia of 4th and 5th toes of the right foot. Partial anæsthesia at the lower part of tibia. On posterior aspect of thighs there are pale coloured maculæ covering a large area and spreading down below the knee-joints.

Diagnosis—Maculo-anæsthetic leprosy

Bacteriological examination of nose—Negative

Condition, May 1919

All the maculæ are slightly improved. Anæsthesia still remains in the same condition of August, 1918.

Result—Slight improvement

Bacteriological examination of nose—Negative

Case XVII

Born Bangkok, resides Bangkok. No family history of leprosy. Two elder sisters suffered from tuberculosis. Tobacco, yes.

Duration of disease 21 years. Disease first commenced with anæsthesia of right foot, then both legs and feet, then hands. Then macules all over body and face. Anæsthesia all over body, then ulcers on feet, last on hands. There are no tubercles.

Condition, May 1918

General anæsthesia of right foot, cicatricial contraction of all toes. No ulcers.

Left foot—Cicatricial contraction of all toes. Deep ulcer outside palmar surface of foot.

Left hand—Cicatricial contraction of terminal phalanges except thumb, retraction of all fingers, claw hand.

Right hand—Claw hand, ulcer on back of index finger.

No other disfiguration.

No history of scabies.

Diagnosis—Maculo-anæsthetic leprosy.

Treated with sodium gynocardate "A" intravenously injected and by mouth.

Condition, September 1919

Started injection in the month of May, 1918 up to September, 1919 total $1\frac{1}{2}$ years.

Right arm—Anæsthesia on the back of right arm from the end of fingers to the below of elbow-joint. No anæsthesia on the front of the arm, but anæsthesia from the end of fingers to the middle of hand.

Left arm—Anæsthesia on the back of arm from fingers to elbow-joint. Anæsthesia on the front of the arm is similar to right arm.

Fingers—Ulcers between the fingers of both hands have entirely disappeared.

Right leg—Complete anæsthesia of entire foot. There is a new ulcer size 1 inch at the middle of palmar surface of foot.

Left leg—Complete anæsthesia over entire foot, ulcer outside palmar surface of foot is improved.

Toes—Sores between the toes of both feet have entirely disappeared.

Body and face have still partial anæsthesia.

Summary

1 General anæsthesia improved. She can now feel ant-bites anywhere over the body. Previously ants used to get into the wound on her foot and she never felt them. Now she does.

2 All maculæ have disappeared.

3 All ulcers have healed except the one on her left foot which has much improved.

4 Her general condition is enormously improved, and she now finds life worth living, even with her deformity.

5 No fresh clinical symptoms have appeared.

General result—Very marked improvement.

Bacteriological examination of nose—Negative.

Case XVIII

Condition, June 1918

The patient has had leprosy since he was 1 year old. His father's death was due to leprosy. He has three brothers and one of them is infected with leprosy. The patient is now 10 years old.

There are tubercles on the right cheek, chin, the lobe of the ears, behind the hinge joints, and the right arm also on the buttock and thighs, extending down below the calves. The left arm is covered with maculæ.

Ulcers on wrist joints, knee and feet.

Anæsthesia of the left ear and the right cheek, the arms, hands, fingers, legs and feet.

Diagnosis—Tubercular leprosy.

Condition, June 1919

Tubercles nearly all disappeared Ulceration healed up Sensation has returned in all parts

Result—Lesions very markedly improved

Bacteriological examination of nose—Negative

SUMMARY

Total number of cases reported on from 1917 to 1919,—18

New cases in 1918	5
Cases carried over from 1917	13
Cases disappeared	4
	—

Total cases reported on from 1917 to 1919 22

(a) All clinical symptoms and lesions of leprosy completely disappeared in cases 4, 7, 8, 15

In case 4 for 18 months

In case 7 for 9 months

In case 8 for 6 months

In case 15 for 6 months

Total cases—4

(b) Very marked improvement in the symptoms and lesions

Cases 1, 3, 6, 9, 13, 14, 17, 18

Total number of cases, 8

(c) General improvement in case 12—one case

(d) Slight improvement in case 16—one case

(e) No improvement in no cases

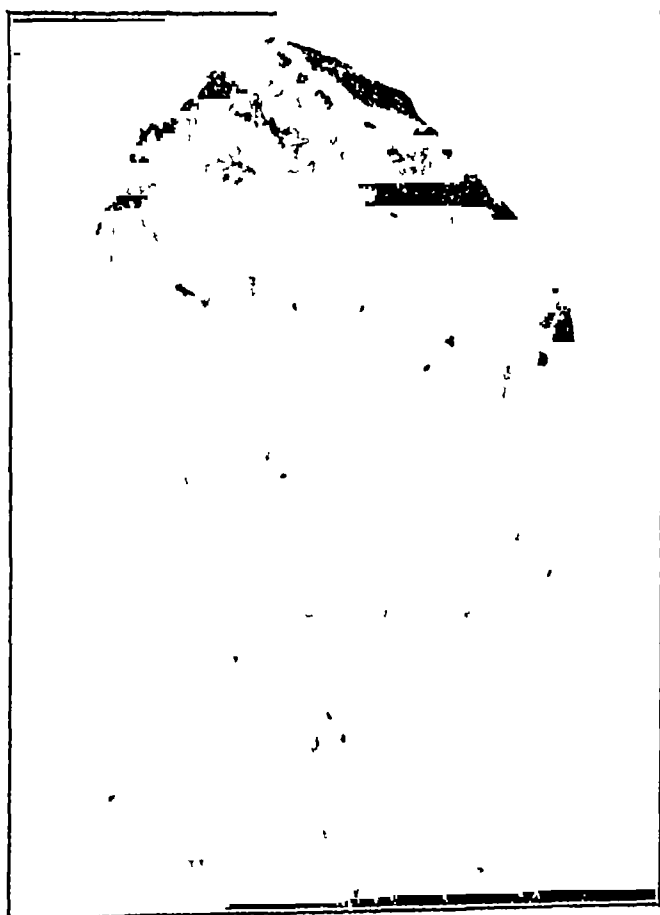
(f) Cases in which retrogression was apparent in 1919, but showing total marked improvement over 1917, cases 3 and 6—two cases

In all cases the most marked feature is the effect of the drug on the general health which so rapidly returns to the normal

It is to be regretted that cases 2, 5, 10 and 11 have disappeared from my control, as cases 10 and 11 shewed every sign of such marked improvement as to lead one to hope for complete disappearance of all lesions

scrotum On palpation it was found to be solid like a stone with base upwards and apex downwards There were two fistulæ, one on the penile urethra and the other on the scrotum, both for the last three years The case was diagnosed to be that of a stone in the scrotum

Previous history was that 7 years back he got a small impacted stone in the penile portion of the urethra, for which an attempt at extraction was made, but it could not be taken out Linseed poultices were applied and ammonium chloride given internally There was a lot of suppuration The stone was then of the size of a betel-nut and probably got into the scrotum rupturing the urethra, and there it grew to its present size



The swelling was painted with tincture of iodine, and under chloroform an incision was made into the median raphé by Rai Sahib Dr Mathra Das, Eye Hospital, Moga, on the same night and the stone was removed The stone was very big, mango-shaped and excavated at its upper part It was phosphatic in nature, hard and smooth, and the urine alkaline The stone weighed six ounces and one drachm The part was douched with hot saline, sutures applied and catheter put in Catheter was removed after five days but sutures gave way The part went on healing and the patient began to pass urine through the meatus and was discharged on 8th April, 1919, as cured

A Mirror of Hospital Practice

A STONE IN THE SCROTUM

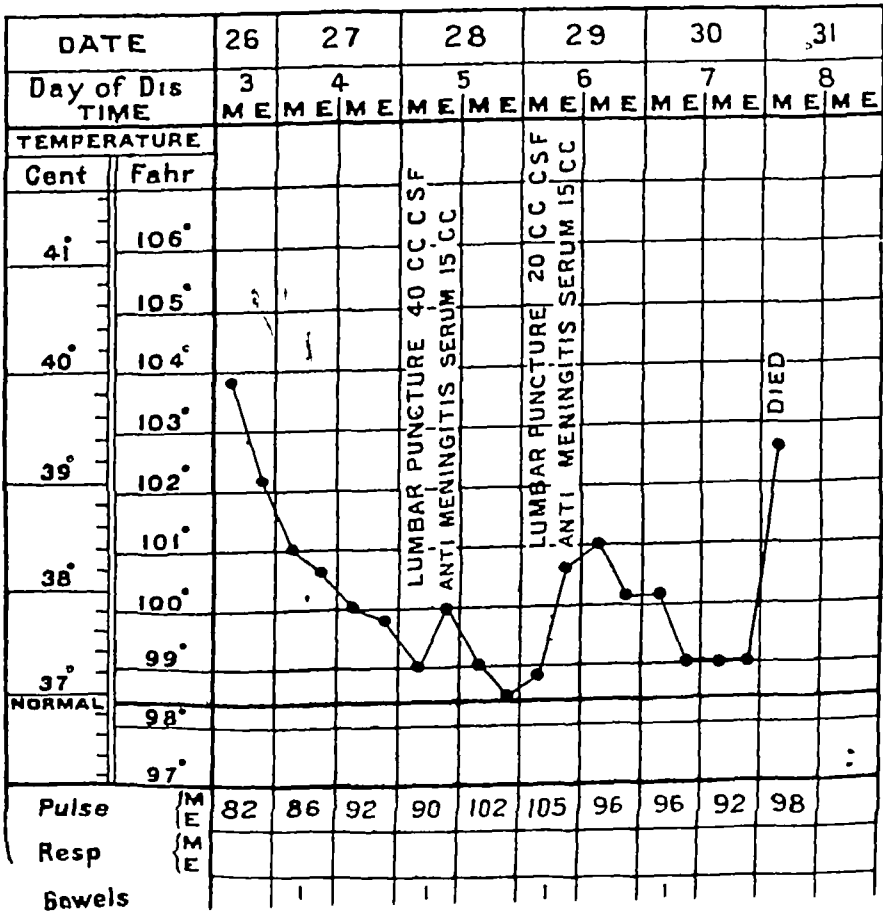
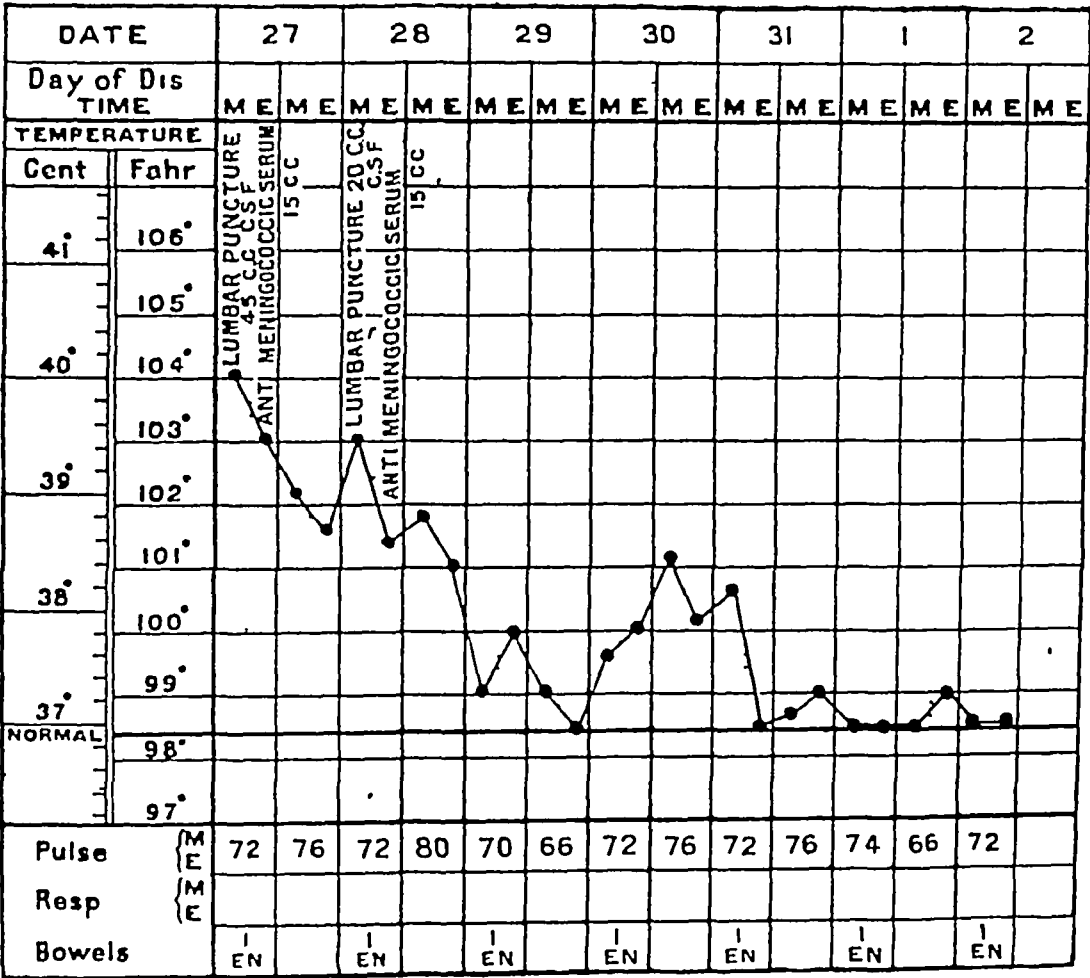
By BALAK RAM GOHL,

Srinagar

MOHAMMAD, potter, aged 25 years, resident of Kandhewal, District Ferozepore (Punjab), was admitted into the Moga Hospital on 7th March, 1919, with a big swelling of the

NOTES ON TWO CASES OF CEREBRO-SPINAL MENINGITIS DUE TO THE DIPLOCOCCUS INTRACELLULARIS, TREATED WITH INTRATHECAL INJECTIONS OF ANTI-MENINGOCOCCIC SERUM (MULFORD), IN A FIELD AMBULANCE IN MESOPOTAMIA.

By CAPTAIN J C JOHN, I M S,
Karachi



NOTES ON TWO CASES OF CEREBRO-SPINAL MENINGITIS DUE TO THE DIPLOCOCCUS INTRACELLULARIS TREATED WITH INTRATHECAL INJECTIONS OF ANTI-MENINGOCOCCIC SERUM (MULFORD) IN A FIELD AMBULANCE IN MESOPOTAMIA

By J C JOHN,

CAPTAIN I M S

Karachi

CASE 1—Sepoy, G K, admitted on 26th March, 1916, with the following history—unwell the last 2 days, with pyrexia, headache and pain in the back

On admission—Temperature 103.8, pulse 82

Symptoms—Headache, drowsiness and pain in the back

Physical signs—Slight retraction of the head, tongue furred, chest and abdomen natural Kernig's sign well marked, knee jerks absent, plantar response flexor He appeared somewhat dazed, but was in full possession of his senses He was put on milk diet, calomel gr 5 and aspirin, phenacetin and caffeine given The next day he was much better but the physical signs were unchanged Temperature 101, pulse 86

28th March—Mental condition dull, very drowsy, later became restless and delirious Lumbar puncture was performed and 40 c c of turbid fluid obtained, under pressure Quite a large precipitate formed at the bottom of the test tube Fifteen c c anti-meningococcic serum (Mulford) was slowly injected into the thecal cavity, by the evening patient had regained consciousness and recognised and spoke to his friends He was very restless at night and sedatives were given

29th March—Temperature 98.8, pulse 105 Semiconscious—retraction of head pronounced—other symptoms as before Lumbar puncture was again performed and 20 c c turbid, blood-stained fluid withdrawn—a further 15 c c anti-meningococcic serum was injected Patient was quiet for a few hours after the injection, but never regained consciousness, he became restless as the day advanced, and sedatives were given

30th March—Temperature 100.2, pulse 96 Patient was in a sinking condition, quite unconscious and breathing stertorously He died the next day

Bacteriological examination—Films of the deposit in the cerebro-spinal fluid were stained with methylene blue and large numbers of polymorphonuclear cells were found to be present, a few intracellular diplococci were present

CASE 2—Sepoy S R, admitted on 27th March, 1916

History of case—Complained of headache the day before, had no temperature

On admission—Temperature 104, pulse 72 Was delirious and throwing himself about, and had to be held down by an orderly

Physical signs—Marked retraction of head, tongue coated with fur Kernig's sign well marked, knee jerks absent, no rash, no squint Plantar response flexor Lumbar puncture was performed and 45 c c of cloudy fluid was withdrawn under pressure, 15 c c anti-meningococcic serum was slowly injected intrathecally Patient was much quieter after the fluid was removed, regained consciousness and complained of headache, took his milk without trouble

28th March—Temperature 103, pulse 72 Much quieter and quite conscious, still complained of headache Lumbar puncture was again performed, 20 c c turbid C S fluid was withdrawn, under pressure, and 15 c c anti-meningococcic serum injected The next day his temperature was normal, his general health was good, he took his food well, but complained of headache, bowels were opened with enemata daily Improvement was maintained, the temperature rose to 101 on the 30th, but was normal again the next day A crop of herpes labialis appeared on the 1st His condition was sufficiently good to permit his being moved to a clearing station on the river the next day

Although the further progress of the case is unknown, there is every reason to believe he made a good recovery

Bacteriological examination—Similar to first case

THE AFTER-TREATMENT OF LEPROSY

By DR. E. MUIR.

(Read before the Calcutta Leprosy Conference, February 1920)

MR. OLDRIEVE has asked me to write a short paper on the after-treatment of leprosy I am afraid that anything I may suggest in this direction must be very hypothetical

After-treatment implies treatment after the main cause of the disease has been eliminated Now we have no absolute proof, as far as I am aware, that the main cause, *i.e.*, the lepra bacillus, has been absolutely eliminated in single case The fact that cases which months had shown no signs of the disease have either had relapses or shown a marked reaction after an injection of sodium morrhuate as recorded by Sir Rogers,* and as I have myself found in

* Paper read before the medical section of Society by Sir L. Rogers.

or two cases, a reaction lasting one or more weeks and accompanied by great debility, shows that it is too early yet to be confident that all the bacilli have been eliminated.

If we take the after-treatment, however, as dating from the time when all signs and symptoms have disappeared, and the patient is fit and able to return to his work, then we have something practical to work with.

As in the case of the tubercular patient, the causal bacilli may lie latent in the body quite unsuspected for a very long period and take on renewed activity only when some intercurrent illness causing temporary debility gives them an opportunity to act.

As with the tubercular patient, therefore, it is necessary in the after-treatment of the leprosy patient always to keep this point in mind.

The treatment should therefore be lengthy; the patient should be kept under observation for several years after all lesions have disappeared so that any signs of returning active disease may at once be detected and dealt with.

It is possible for patients to carry on their own treatment for some time after treatment with injections has ceased by taking pills of sodium hydnocarpate or sodium morrhuate. Probably oil of some nature or other in a digestible form should always form a large part of their diet.

It will be an important piece of research to find out what is the cheapest oil that is beneficial in leprosy, as so many lepers are unable to afford anything expensive. If linseed oil or the oil of the soya bean or the salts formed from these oils prove beneficial when given by the mouth, it will be easy to carry on a mild form of after-treatment without inconvenience to the patient and with but little expense.

If also any of these oils when used as an unguent prove beneficial, it will be easy for the patient to substitute the beneficial oil for the mustard oil generally used by Indians for rubbing on their bodies. But all these suggestions are waiting to be worked out, and it is impossible at present to say what will prove the most effective plan.

I have frequently noticed that patients who have discontinued the injection treatment for some time have continued to improve, the change for the better being most extraordinary when they returned after a month or two to continue the treatment. This would seem to suggest that sodium morrhuate and hydnocarpate have a cumulative power and may be stored up in the body, and the amount thus stored up continues to act in the interval. This may partly account for the fact that injections may often be given for a long time without

producing any reaction when at last a very marked reaction is produced by a dose no larger than the previous ones. Probably a certain amount of the drug has been accumulating in the body for some time, and this added to the last dose has been sufficient to produce the marked reaction.

If we apply this principle to the after-treatment of patients, it will be seen at once that when the injections cease the patient may have a large amount of the drug stored up in his body which may be sufficient to prevent any return of active disease for some months, but as the drug becomes gradually eliminated from the body, a time may come when the bacilli which are lying latent in the body may again break forth into activity and cause a return of the disease. It might, therefore be advisable for patients who have discontinued injections to return at intervals of a month or two for a short course of injections.

Under after-treatment, it is also necessary to consider the employment of pauper patients. Some of them may be more or less crippled and an industrial school should be attached to each leper hospital, so that as the patients recover, they may be taught some useful trade suited to their condition and their ability. His trade will then form a point of contact with the hospital after the patient has been discharged and make it more simple to keep in touch with him and carry on the after-treatment.



Indian Medical Gazette.

APRIL

SYPHILIS OF THE CIRCULATORY SYSTEM

THOUGH universally recognised as a very potent factor in the causation of certain well-known diseases such as aneurysm, Stokes Adams' syndrome, certain forms of meningitis, hemiplegia, etc., syphilis of the circulatory system is not by any means universally understood by the medical profession. It is, therefore, a great pleasure to read the lucid exposition of the subject by Dr Ivy Mackenzie, in a current number of the "Glasgow Medical Journal."

In his preliminary remarks Dr Mackenzie points out that, from the very nature of its pathological character, syphilitic infection is more intimately associated with the circulatory system than with any other system of the body. Nevertheless, with the exceptions of aortic aneurysm, coronary stenosis, or cerebral endarteritis, syphilis of the circulatory system usually escapes the recognition of the clinician.

Infection in the first place takes place through the lymphatics—perivascular lymphatics of the genital chancre—nearest lymph glands—iliac lymphatics—thoracic duct—embolic spread through the blood stream causing the well-known cutaneous lesions.

From the emboli in the peripheral sites thus formed development again proceeds in the perivascular lymphatics, certain tissues of the body such as the epidermal tissue of the skin, mucous membrane of the mouth and throat, and the central nervous system exhibit a special predilection for the spirochæte. Lesions of these tissues have long been recognised and understood by the clinician. Knowledge of the actual diseases of the circulatory system clinically attributed to syphilis, however, exhibit a deplorable state of confusion. For instance, aneurysm of the aorta is usually recognised as being due to this disease, but myocardial involvement is considered to be rare. Again, early cerebral phenomena, such as hemiplegia due to meningitis, are attributed to endarteritis, whereas the arterial condition here is only the vascular accompaniment of

the meningitis and the disturbance is due to irritation and pressure of the exudation.

Syphilis and arterial disease—Dr Mackenzie refers to Turnbull's excellent publication on arterial disease as helping to create order from confusion, and says the latter's conclusions are confirmed by his own observations. Turnbull divides arterial lesions into (1) hypertrophies, (2) degenerations, (3) infiltrations, and (4) inflammations.

1 Under the heading hypertrophies he confines himself to the well-known cardiovascular hypertrophies, with high blood pressure and involving both the heart and large muscular arteries.

From an analysis of his case he considers that syphilis is not a special determining factor in such cases, and that the incidence of cardio-vascular hypertrophy is not greater in syphilis than in non-syphilitic cases.

2 There is no evidence that syphilis is the cause of any of the non-inflammatory degenerations such as the primary intimal atheroma, or the fatty, calcareous and fibrotic degenerations of the media.

3 Although syphilis is a factor in amyloid infiltration of the vessels, its influence is not to be compared with that of osseous tubercle.

4 Syphilis is undoubtedly the most frequent and important cause of inflammatory degeneration of the blood and lymphatic vessels. It may occur (1) as arteritis in the brain in the secondary stage, usually in association with meningitis, (2) as phlebitis or periphlebitis and venous thrombosis, also in the secondary stage, (3) as gummatous degeneration of the large arteries, more particularly of the aorta, in the tertiary stage, (4) as gummatous phlebitis in the tertiary stage, (5) and as gummatous degeneration of the brain arteries in the tertiary stage.

Syphilitic Aortitis—The most important degeneration from the point of view of the clinician is syphilitic aortitis, which usually involves the aortic valves and the coronary arteries.

The pathological characteristics of the condition are—

1 Predilection for the ascending part of the aorta and infrequency in the abdominal aorta.

2 Star-like cicatrization of the intima.

3 Thinning of the media through destruction of elastic tissue.

4 Infiltration of the adventitia with involvement of the vasa vasorum

Syphilitic aortitis may be associated with (1) aneurysm, (2) endocarditis, (3) narrowing of the coronary arteries, and (4) myocarditis

1 Aneurysm, of course, may arise from causes other than syphilis, but it is significant that Turnbull found evidence of aneurysm formation in all of the 175 cases of syphilitic aortitis observed by him, 30 per cent of which gave rise to clinical manifestations

2 Aortic endocarditis was noted in 156 per cent of Turnbull's cases, and Dr Mackenzie believes that aortic incompetence commencing in middle life, in a patient with no history or evidence of rheumatism, and no organic disease of the mitral valve, is nearly always syphilitic

3 Narrowing of the coronary arteries leads to a nutritional fibrosis of the cardiac muscle, and is one of the commonest causes of sudden death from heart failure. It may also give rise to anginal attacks

4 Syphilitic inflammatory infiltration and fibrosis of the cardiac muscle is a very common accompaniment of aortitis, but the amount of muscular destruction caused thereby cannot be said to be such as to give rise of itself to cardiac weakness. It is probable that the accompanying conditions such as lesions of the aortic valves and coronary arteries are sufficient to account for the symptoms

Syphilis of the large muscular arteries—Syphilis of the large elastic branches of the aorta, and syphilis of the large muscular arteries is much rarer than aortitis. Turnbull observed it only five times in 288 cases

The small muscular and elastic arteries—Apart from arterioles and small arteries in the neighbourhood of gross syphilitic lesions, the basal arteries of the brain are the most frequently affected. In recent cases the pathological process is confined to the adventitia. The intima is usually the seat of proliferative changes. The characteristic point which distinguishes syphilitic intimal proliferation from that of arterio-sclerosis is the irregular dispersion of the fibrous and elastic fibres

Syphilis of veins—Veins may be affected at the site of the primary lesion or in the route of infection from its source. They are also affected in cutaneous lesions in the vascular disturbances associated with recent brain

syphilis. Syphilitic phlebitis may occur both in the secondary and tertiary stages. Certain so-called varicose ulcers of the lower extremities are syphilitic and yield readily to anti-syphilitic treatment

CLINICAL MANIFESTATIONS OF SYPHILIS OF THE CIRCULATORY SYSTEM

Early symptoms referable to the heart are usually due to general toxæmia and not to any specific action

Phlebitis—Early syphilitic phlebitis may give rise to generalised pains, which are not acute and are usually passed over as "neurotic" or "rheumatic". They disappear with the subsidence of the acute secondary symptoms and rarely give rise to inflammatory changes

Arteritis—Syphilitic arteritis is present in practically every syphilitic lesion, in chancres, secondary nodular gummata, and in meningitis. It is of prime importance when affecting the cerebral arteries, particularly the terminal arteries of the basal nuclei. Conditions such as hemiplegia and monoplegia, in the late secondary stage are considered by Dr Mackenzie to be due to pressure of exudate and not to occlusion of arteries

Aortitis—Syphilitic aortitis is rarely recognised during the first ten years following infection. The majority of Turnbull's cases came to necropsy between 20 and 26 years after infection. It is not until irreparable damage has been done to the circulatory apparatus that it gives rise to symptoms

Premonitory symptoms are sometimes met with. Feelings of discomfort and abnormal sensations in the heart-region, occasional attacks of palpitation, indefinite pains and sensations of pressure in the breast, may occur in varying degrees of severity. Symptoms such as these in anæmic, cachectic men 30 to 50 years of age, perhaps with uncomplicated aortic incompetence, and without a history or evidence of rheumatism, should lead the physician to make a thorough search for signs of syphilis and aortitis. A Wassermann test should be done and, above all, a radiological examination of the chest should be made. Once a syphilitic basis has been determined, no time should be wasted in interpreting the precise anatomical lesion. Treatment of the underlying infection should be proceeded with vigorously

Syphilis of the myocardium—Gross syphilitic lesions comparable with aortitis or cerebral syphilis do not occur. Isolated gummata, and perivascular granulomatous infiltration, have been observed but they rarely give rise to symptoms. In syphilis of the heart, narrowing of the coronary arteries with low blood pressure, due to aortic incompetence leading to fibrosis of the myocardium, plays a much more important part than any direct syphilitic involvement of the musculature of the heart.

Heart block, as Dr Mackenzie points out, is the one condition in which a localised syphilitic lesion of the heart causes definite clinical symptoms. The auriculo-ventricular bundle of His, as it passes through the septum fibrosum, lies immediately beneath the aortic valves, and is liable to be involved in the spread of the degenerative process from the root of the aorta and the valves.

Treatment—As already pointed out, irreparable damage has usually resulted before a diagnosis can be made in the case of aortitis. The therapeutic procedure will naturally depend on the nature of the manifestation of syphilis and the stage to which the disease has advanced.

1 Early lymphatic, perivascular, and phlebitic infiltrations usually disappear under the influence of salvarsan and mercury.

2 Cerebral arteritis or meningitis of the late secondary stage should be treated with salvarsan until a total of 3 or 4 grammes has been given followed by mercury.

3 Late cerebral arteritis (chronic meningitis) should be treated by the initial administration of mercury and iodides for 14 days, followed by gradually increasing doses of salvarsan in addition.

4 In the case of aortitis with possible coronary and myocardial complications, general hygienic measures directed towards restoring the efficiency of the circulation to the greatest extent possible should first be resorted to. Then iodides and mercury should be administered for a fortnight, when 0.1 gm of salvarsan may be given. This dose may be repeated every three days for a fortnight, when the dose may be increased to 0.2 gm, in the case of a vaso-motor reaction (bounding and quickened pulse, flushing of the face, etc.), the injection be stopped at once.

5 Varicose ulcers or chronic phlebitis of the later stages should be treated with

salvarsan and mercury. A good local application for syphilitic varicose ulcers is a solution of alkalinised salvarsan (1 in 30) applied on gauze alternated with fresh human serum.

Current Topics.

The Metabolic Gradient Underlying Peristalsis

Journal of American Medical Association,
November, 1919—W C ALVAREU, M.D.

SOME years ago the writer showed that there is a definite gradient of rhythmicity in the muscle of the small intestine from duodenum to ileum. He points out that wherever we find movement in this world we find a gradation of forces. Thus water, electricity, etc., when in motion, all follow gradients of their own. The impulse in the heart follows a gradient of rhythmicity, and in the stomach and intestines the contents move from regions of high rhythmicity, high irritability and high tone, to regions of low rhythmicity, low irritability and low tone.

More recently he has been able to show that there is also definite gradient of oxidation and carbonic oxide production in the intestinal wall underlying, and probably giving rise to the other gradients of rhythmicity, tone, etc. Segale has shown that local life processes are greatly speeded up by inflammation. Hence we have hypermotility in duodenal ulcer and cholecystitis, hypomotility in appendicitis, etc.

Galvanometric studies of bruised tissues suggest strongly that metabolic rates are increased by trauma. This may be the explanation why the intestinal contents cannot approach or pass through segments of the bowel which have been recently injured. A local increase in the metabolic rate would make the gradient uphill in the section of bowel just oral to the lesion.

Reversal of the gradient may also be brought about by low concentration of certain poisons, or lack of oxygen, etc. Child has shown that tissues with a fast rate of oxidation are more susceptible to the effect of certain poisons, and the writer has shown that the duodenum is more sensitive to potassium cyanide and to lack of oxygen than is the ileum. Gastric and intestinal stasis in sick animals is not always due to failure of peristalsis but rather to the unequal effect of the toxins on the muscle of different parts of the intestinal canal.

In the discussion which followed, Dr F W White of Boston, referred to some experiments carried out by him to test the above hypothesis. The cæcum in cat was irritated with a few drops of mustard oil injected

through a rectal catheter. He found that moderate irritation had no effect on the emptying of the stomach. Marked irritation caused either delay or hyperperistalsis with very rapid emptying. Intense irritation caused reverse peristalsis in the stomach emptying of its contents.

Dr Case said he had some time ago noted in the case of colonic obstruction that the farthest point attained by the barium meal is usually some feet short of the actual point of obstruction in the bowel. This could easily be explained on Alvarez's theory since the barium could not enter the area of peristaltic disturbance.

The Fundamental Physiological Reaction in Anaphylactic and Peptone Shock

Journal of American Medical Association,

November, 1919—J P SIMONDS, M D

IN describing the symptoms of anaphylactic and peptone shock, the writer refers to the immediate fall in arterial pressure, a simultaneous fall in venous pressure, a rise in portal pressure with enlargement of the liver, the last-named phenomena indicating an impediment to the flow of blood through the liver. These observations were made on the dog. It has, however, been shown that no such fall of blood pressure is seen in the case of the guinea-pig and rabbit. In explanation of this it has been found that the wall of the hepatic vein in dogs contains a relatively enormous amount of plain muscle. It would therefore appear that the fundamental physiological reaction in anaphylactic and peptone shock in dogs is a spasm of the smooth muscle in the walls of the hepatic vein and its branches.

In discussing the above results the author concludes as follows—

1 It is known that in the guinea-pig the finer bronchioles are "practically nothing but muscular tubes" (Oppel, cited by Auer and Lewis). The characteristic clinical manifestation of these conditions in the animal is a violent dyspnoea in which it can get air into its lungs, but is unable to get it out. The dog and certain other animals have hepatic veins supplied with exceptionally large amounts of smooth muscle. The manifestations of anaphylactic and peptone shock in dogs have just been described. It seems possible therefore, that the basis for these differences in the reaction of different animals in shock of this kind is an anatomical difference in

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nary to recall that

among the theories advanced by various authors who have studied shock under war conditions, is one which makes the absorption of the soluble products of damaged muscle in wounds responsible for the condition. Furthermore, it is obvious that any prolonged spasm of the hepatic vein and its branches, such as occurs in peptone shock in the dog, will lead to the same condition in the general circulation, or at least in the splanchnic area of sequestration of blood in the venules and capillaries as was observed by Jackson and Janeway in the shock produced by them by the mechanical obstruction of the vena cava for limited periods of time.

3 It is evident, also, that in interpreting the results of experiments on dogs especially those which have to do with blood pressures, this peculiarity of the hepatic vein must be taken into consideration. This will be discussed more fully in a paper on the interpretation of the blood pressure curve following injections of epinephrin (adrenalin).

The True Nature of Multiple Exostoses.

The Medical Press, December 17, 1919—PROFESSOR ARTHUR KEITH, M D, F R C S, F R S

PROFESSOR KEITH's attention had been drawn to the nature of the condition underlying multiple exostoses by X-ray plates of a man, taken by Captain Anan in France, in 1918. The lower end of the shafts of this man's femora, and the upper and lower ends of the shafts of the tibiae were affected. The appearances observed are best explained on John Hunter's teaching concerning the growth of bone. This writer taught that the shafts of long bones grew by a double process. New cancellous bone is first laid down at the extremities of the shaft, in the diaphysial lines. In the second or "modelling process" this cancellous bone is absorbed and gradually converted into the compact bone of the shaft with its medullary cavity. Investigation of the case mentioned showed that the diaphysial ends of all the bones of the body manifested a similar disturbance of growth, *viz*, arrest of the "modelling process". This resulted in an irregular cylinder of imperfectly modelled bone, interposed between the properly formed part of the shaft and the epiphysial end, which exhibited several outgrowths on its surface.

Bones formed in a membranous basis, such as those of the face and vault of the skull, are not affected. Nor are bones formed in cartilage, such as the epiphyses of long bones, the vertebrae, sternum, carpal or tarsal bones. It was only when the two processes—membrane formation and cartilage formation—came into juxtaposition that the peculiar disorder of growth occurred. It is most marked where growth is greatest. In the upper extremity

the proximal end of the humerus and the distal ends of the radius and ulna are most affected. In the lower extremity the growth and consequent disturbance is greatest at the knee-joint, but there may also be ample evidence of the disorder at the proximal end of the femur and the distal ends of the fibula and tibia. The growing edge of the os innominatum and the vertebral border of the scapula are also affected. The clavicles may be affected at both ends.

Professor Keith said he had arrived at the conclusion that the disease ought to be removed from the category of tumours and placed among the disorders of growth under the name suggested by Mr Morley Roberts, "diaphysial aclasis." Unlike the achondroplasia, which results from an arrest of growth within the cartilaginous growth disc (epiphysial line), in diaphysial aclasis the defect lies in the growing edge of the periosteal ferrule which surrounds every cartilaginous growth disc. He does not exclude the possibility of a definite disorder of the growth disc itself. Indeed, as seen in X-ray plates, the growth discs of the shafts of long bones have the same irregular notched appearance as in late rickets. As a result of the retardation of periosteal growth it came about that large areas of cartilage formed bones laid down at the ends of the shafts of long bones are left exposed. It is here that irregularities and exostoses arise.

According to Professor Keith, in normal development the primary changes, preceding the invasion of the cartilage territory by the bone cells, occur in the cartilage cells themselves. In achondroplasia the essential lesion was a failure in this preliminary transformation of the cartilage cells at the edge of the growing epiphysial disc. The disordered growth seen in achondroplasia had so many resemblances to the growth disturbances seen in cretins that there is some justification for placing this disease in the thyroid insufficiency group. If this is done diaphysial aclasis must also be placed alongside it.

Effectual Treatment of Malaria.

Grece Medicale, Athens

January to June, 1918, 20, Nos 1 to 12

The Journal of the American Medical Association, February 22nd, 1919

CARDAMATIS insists that to give quinine in an ineffectual manner not only perpetuates malaria but drives the public to quacks. He has worked out a technique which has radically cured 98 per cent of all types of malaria and his experience and experimental research on the human have absolutely confirmed its efficacy, he reiterates. He has been in charge for many years of the State campaigns

against endemic malaria at different points in Greece, and also of the campaigns under the auspices of the Hellenic Antimalaria League. Tens of thousand of malaria subjects have passed through his hands and been followed long enough for the ultimate outcome to be known. He declares that administrations of quinine by the mouth is as effectual as by injection. His technique was worked out by comparative study of the effects on different series of six or eight groups of up to sixty persons each, with subgroups of eighteen with one of the three types of hæmatozoa in the blood, and two with mixed infection. The results in each series are grouped in a table for comparison. The effectual method proved to be as follows—He begins the course with 1.60 gm at the first moment of deferescence, during the sweating stage. This dose is divided in two parts, taken at a half-hour interval. After this, for eleven days 1.50 gm is given, seven or eight hours before the attack. Then suspension for four days, after which 1 gm is taken each evening not long before retiring, and this is repeated for eight consecutive days. Then suspension for a week, after which 1 gm is taken at bed-time the sixth and seventh days of each week. This procedure was rigorously followed for two months in the case of vivax infection, benign tertian, and for three months with præcox or mixed tertian. After this, if the mosquito season is on he advises preventive treatment, namely the first and the second days 0.35 gm and the third day 0.50 or 0.60 gm.

This whole procedure applied systematically and rigorously for several years has given results, he says, *litteralement miraculeux* far superior to anything else known to date. That is, the radical cures have amounted to 98 per cent. By giving the quinine exactly from eight to seven hours before the attack the largest quantity is absorbed just as the schizogony of the hæmatozoa reaches its highest point. Above the age of 17 the dosage is the same as for adults. For young infants he gives one-eighth of the doses, from 1 to 2 years of age one-fourth, from 4 to 5 three-eighths, from 6 to 9, one-half, from 10 to 13, five-eighths, and from 14 to 16 six-eighths. In the exceptionally resistant cases he doubled the standard doses or took other exceptional means of quinization. Persons inoculated with infected anophels and then given 0.40 gm of quinine every day with 0.60 gm every third day during the entire summer, never developed any symptoms of malaria. On the other hand the same mosquitoes biting 10 other persons who took after and 1 gm quinine for seven days gave rise to malaria in 33 per cent of the subjects, none developing in two or three weeks of the præcox in the blood. The quinine was the 0.2 gm tablets supplied.

Transfusion of Blood After Abdominal Injury.

Correspondenz-Blatt für Schweizer Aerzte,
Basel, December 21, 1919
48, No 51

The Journal of the American Medical Association,
February 22nd, 1919

FONIO reports the case of a young hunter who took up his gun by the muzzle and shot himself in the ileocecal region. The laparotomy three hours later showed fourteen perforations of the small intestine. The 95 cm segment of intestine with twelve perforations and two holes in the mesentery was resected, and the two other perforations were sutured. The abdomen was flushed with saline until it came away clear. After the operation, 500 c c of saline with 7 drops of epinephrin were infused, the legs bound and raised, the tetanus serum, camphor, etc., injected. Six hours later the radial pulse having become imperceptible 250 c c blood from the patient's sister were transfused, and by the eighth day the young man was ready to return to work. He would undoubtedly have succumbed if it had not been for the transfusion of blood. *The transfusion was done by the citrated method.* The 250 c c blood sufficed to restore the pulse permanently. Fonio explains this benefit as due to the breaking up of the vicious circle by the influx of fresh blood supplying the heart muscle with blood through the coronary circulation, and thus giving it nourishment needed to enable it to resume its task. This in turn supplied all the organs with nourishment and started normal functioning anew throughout the organism. He advises continuing the transfusion until the pulse is full and strong again. This occurred with 250 c c in his case. The patient vomited afterward, and albumin and casts appeared in the urine. Healthy robust donors closely related to the patient, transfusion of not over 250 c c, and waiting to note the effect of this, will ward off injurious by-effects. In urgent cases even the general practitioner need not hesitate to apply it, to facilitate this, he gives illustrations of the details of the technique. He ascribes the priority to Agote.

Cure of Adiposis Dolorosa.

Grèce Medicale, Athens

January to June, 1918, 20, Nos 1 to 12

The Journal of the American Medical Association,
February 22nd, 1919

CECIKAS reports a case in a man of 32, married for six months, which, he thinks, throws light on the etiology of the disease. The pressure of the man's body against his lipomas, and the immediate effect of an injection of pituitary extract on retention of urine confirmed the influence of the

pituitary on the innervation of the bladder, but the primal factor in Dercum's disease seems to be some abnormal or lacking hormone from the organs of reproduction. This seems to upset the normal balance in the chromaffine system. His patient was clinically cured, even to the reprogession of the lipomas, by systematic treatment with extract of thyroid 1 part, extract of pituitary 1 part, and of ovary 2 parts, supplemented by a vegetable diet and exercise in the country. Whenever this treatment was interrupted, the whole set of symptoms returned, even including some of the tumours. The patient learned to make his organotherapeutic products himself, making a cold extract of thyroid and testicles, 1 4, from sheep 1 or 2 years old (Extraction cold, 50 c c, phenol, 0.05). He took a teaspoonful of the extract morning and evening in warm soup. CECIKAS recalls that Dercum in describing his first case of adiposis dolorosa noted its connection with the thyroid.

Cases Simulating Renal Calculus

The Glasgow Medical Journal—DAVID
NEWMAN, M.D.

DR NIWMAN gives details of four cases in which not only the symptoms but also the X-ray picture closely simulated renal stone. He acknowledges the rarity of such cases but emphasises the importance of exhausting all our methods of investigation before making a definite diagnosis.

The cardinal symptom of renal calculus is pain, and the physical signs are pyuria, hæmaturia, a crystalline deposit, X-ray shadow, and at the orifice of the corresponding ureter, evidence of irritation, and alteration in the character of urinary shoots. While no one of these signs and symptoms is sufficient in itself, Dr Newman is of opinion that the combination of a well marked shadow, with evidence of irritation, as shown by the appearance of the lips and character of the urinary shoots, is sure evidence of a stone in the kidney or ureter.

Suppose the radiogram shows a shadow which in appearance and situation might be looked on as positive of stone. The following physical methods might with advantage be employed.

1 To define the relationship of the kidney and ureter to the shadow.

(a) By passing into the ureter and pelvis of the kidney a bougie charged with metallic salts.

(b) By the injection of innocuous solutions of metallic salts into the pelvis of the ureter.

2 Sounding the ureters and the use of wax-tipped bougies.

3 Observation by the cystoscope of the appearances of the orifices of the ureters, and the character of the shoots of urine which escape.

Case I—Calcified gland in front of the renal pelvis—Shadow simulating renal calculus on the left side—Pain on right increased on exercise, relieved by rest—Pyuria and auralia—Ureter openings normal—Exploration

The patient was admitted for pain in the right lumbar region. The attacks were followed by escape of pus. The pain was increased by exercise and relieved by rest, but never associated with hæmaturia. The urine contained oxalates and pus. On the cystoscope examination the orifices of the ureters were found to be normal. At operation a calcified lymphatic gland was found to be adherent to the pelvis of the kidney in front.

Case II—Shadow simulating renal calculus on the right side, at the level of the last rib and two inches from the spine—Severe pain in right lumbar region—Occasional slight pyuria from right kidney—No tubercle bacilli discovered, only Bacillus coli found—Deposits of uric acid frequent—Pyonephrosis developed later—Nephrotomy—Good result

The patient, a lady aged 31 years, was seen during third attack of acute renal colic. The right kidney was enlarged and tender on pressure. The urine contained mucus and pus and a large amount of uric acid crystals. Bacillus coli communis was present, but no tubercle bacilli were found. Cystoscopic examination showed the mouths of the ureters normal, but pus was seen escaping from the right ureter. A distinct and well-defined shadow was found, oval in shape, at the level of the last rib on the right side, and two inches from the spine. Operation was deferred.

Six months afterwards the renal pain recurred, and fluctuation was definitely felt in the right kidney, which was incised with evacuation of viscid pus. Immediately behind the kidney was an enlarged gland containing a calcified nodule which accounted for the shadow.

Case III—Shadow in renal region simulating calculus—Suspected stones in kidney—History of pain in lumbar region of four years' duration—Painful micturition—Rheumatism—Occasional slightly purulent urine—Oraluria—Shadows increase in number, wide distribution—Ureter orifices normal—Ultimate diagnosis rheumatism with calcareous deposits in tissues—No operation

The patient, a man aged 46 years, had had an X-ray plate taken in London four years before, which showed four shadows, two of which looked like stones in the left kidney and the other two like calculi in the corresponding ureter. Cystoscopic examination of the bladder showed hyperæmia around the neck but the openings of the ureters were strictly normal. Another plate showed not only the shadows seen in the former plates

but in many other regions away from the kidneys or ureters.

As many rheumatic nodules could be felt in the parietes, the patient was handed over to a physician for treatment of rheumatism.

Case IV—Pyuria of three years' duration associated with pain in the right kidney—No hæmaturia—Testicular pain—Frequent and painful micturition—X-ray showed shadow in right renal regions—Tuberculous disease—Pyonephrosis—Nephrotomy

This patient had suffered from occasional attacks of severe pain in the right renal region with intermittent pyuria for three years. An X-ray plate taken shortly after the onset of his illness showed nothing abnormal. He was driven to consult the writer by an enlargement of his left testicle. An X-ray plate now showed a shadow over the right kidney, which was enlarged and painful on pressure. The urine contained pus, oxalates of lime and coli bacilli. Tubercle bacilli were absent. Cystoscopic examination showed an inflamed bladder with cloudy urine escaping from the right ureter. The lips of the opening were thickened and deeply injected. Operation was refused for the time being.

At operation for acute pyonephrosis of the right kidney some time later an old party calcified tuberculous mass was found at the lower pole of the kidney.

Factors Influencing Recovery and Resolution in Lobar Pneumonia

Journal of the American Medical Association, November 8th, 1919 Vol 73 No 19—LORD

RECOVERY from lobar pneumonia like that from other acute self-limiting diseases has been thought to be due to the elaboration of protective substances during the course of the disease. Various observers have proved, by animal experiment, the presence of protective substances in the serum of patients at or about the time of the crisis. The importance of agglutinins has recently been demonstrated by Bull who showed that these substance help in removing the pneumococcus from the blood.

It has long been clear that resolution must be brought about by enzymatic processes and Sorensen has called attention to the important relation between H-ion concentration and enzymatic processes in general.

The following facts suggest that local biochemical changes as well as humoral factors may be of importance—

1 *Acidosis in pneumonia*—That a certain degree of acidosis obtains in pneumonia is shown by the diminished carbon dioxide content, an increased ammonia output, an increased titrable acidity of the blood and an increased alkali tolerance.

2 *Partial isolation of the pneumonic lung*—The exudate fills the alveolar spaces and is separated from the general circulation by the limiting alveolar wall. Biochemical changes (increased H-ion concentration) may therefore occur in it without affecting the H-ion concentration of the blood.

3 *Acid death point of the pneumococcus*—It has been proved experimentally that the pneumococcus grown in glucose bouillon dies out when the H-ion concentration reaches pH 5.1. Living pneumococci exposed to a H-ion concentration of 5.1 live only a few hours, whereas they may live days at a H-ion concentration of 7.4 (that of blood).

4 *Dissolution of pneumococci*—Lord and Nye have shown that a dissolution of pneumococci may take place in H-ion concentrations lower than 5.0, being most marked between 5.0 and 6.0. An enzyme set free by the bacteria themselves may be the explanation.

5 *H-ion concentration of the pneumonic lung*—In fatal cases the H-ion concentration of the press juice from the pneumonic lung is higher than that of other tissues and reaches a pH of about 6.0.

In a dog with experimental pneumonia pneumococci were grown from one lung in which the H-ion concentration was 6.0, but not from the other with pH of 5.4.

The writer had previously shown that pneumonic lung contains two enzymes, *viz*—

1 A proteolytic enzyme capable of digesting coagulated blood serum at H-ion concentrations between 7.3 and 6.7.

2 A peptone splitting enzyme (forming amino-acids from peptone) with an optimum activity in still more acid mediums as high a pH of 4.8. Peptone is thus produced at the lower H-ion concentrations and as the acidity of the exudate increases the peptone splitting enzyme comes into play, producing amino-acids which are readily absorbed.

The writer concludes as follows—

"The findings suggest a theory in explanation of recovery from pneumonia in the course of which humoral immunity is assisted by local biochemical changes. Acidosis in pneumonia may be due to partial isolation of the pneumonic lung, permitting a local increase in H-ion concentration, the excess of acid formed in the exudate gaining entrance to the circulation. Dissolution of the pneumococcus may proceed at first slowly and later more rapidly as the local acidity increases. When the local H-ion concentration reaches the acid death point of the pneumococcus, crisis and recovery follow.

The findings also suggest an explanation of resolution in the course of which the fibrinous exudate is locally split to a form in which it may be readily and harmlessly absorbed. With the breaking down of the cellular exudate, an enzyme digesting protein (fibrin)

in weakly alkaline and weakly acid mediums is liberated. As the acidity increases, the action of this enzyme ceases. An enzyme capable of splitting peptone to amino-acid nitrogen, also active during the proteolysis of the fibrin, is still further activated at an H-ion concentration of 6.3 or 5.2. The exudate may then be dissolved, and resolution takes place."

The Physiologic Basis of the Common Gastro-intestinal Syndromes found in Pulmonary Tuberculosis.

Boston Medical and Surgical Journal, October 1919—F. M. POTTENGER, A. M., M. D., LL. D.

THE author draws attention to the common embryological origin of the respiratory system and the gastro-intestinal canal. The former therefore carries with it the innervation of the mother structure. All smooth muscle and all secreting glands in both systems are activated by the vagus, and inhibited by the sympathetic nerves. The sphincters which have a special mechanism are excluded.

In all acute affections of the lungs accompanied by marked toxæmia, there is a general inhibition of action throughout the intestinal tract decreasing the secretions, and relaxing the muscle of the walls. This action takes place through the sympathetic nerves supplying both systems as a result of reflex action through the sensory nerves from the inflamed area. Hence we get hypomotility and hypochlorhydria as the commonest gastro-intestinal symptoms in all acute infections accompanied by toxæmia.

It is through the vagus (para-sympathetics) that the reflexes take place which affect the gastro-intestinal tract when the lung and bronchi are inflamed. The sensory fibres of the pulmonary vagus mediate with other fibres of the vagus and with other parasympathetic nerves (7th and 9th cranial nerves), and with the 5th cranial nerve.

When mediation occurs with the 5th, 7th and 9th cranial nerves, reflex action results in an increased secretion and an increased irritability of the nasal and oral cavities, the pharynx, salivary and lachrymal glands in vaso-motor disturbance in the cheeks and tongue, and in pain expressed in the sensory neurons of the 5th cranial nerve (headache).

When mediation takes place in other portions of the vagus nerve, reflex action may occur in other parts supplied by the vagus, such as the larynx, pharynx, the bronchi, heart, upper portion of the gastro-intestinal canal, liver and bile ducts, and pancreas. This reflex stimulation, if adequate, will result in the action which normally belongs to vagus stimulation in these structures, increased tone of the muscles and increased glandular secretion.

When the lung tissue is inflamed impulses coursing centralwards in the sensory fibres of the vagus may give rise reflexly to increased tone of the musculature of the intestinal canal, and increased glandular secretion. In this manner arise the so-called functional disturbances of the intestinal canal so common in pulmonary tuberculosis. These include nausea, vomiting, hyperchlorhydria, gastric hypermotility, colicky pains, spastic conditions in the intestines, notably spastic constipation, colitis, diarrhoea, and intestinal stasis. In fact the reflex symptoms of early tuberculosis before marked toxæmia has set in, are practically all expressed reflexly through the vagus in systems other than the lower respiratory tract—the larynx, the heart, the gastro-intestinal tract.

Reflex symptoms do not arise unless the stimulus causing the reflex is sufficient to overcome the action of opposing nerves, such as the sympathetics in the present instance.

The writer does not wish to be understood as maintaining that the syndromes mentioned are always due to reflexes from the lung, but desires to emphasise that inflammation in the lung causes stimuli which have a tendency to produce them, and which may do so when they are strong enough to overcome all the opposing forces acting upon the sympathetics.

Nausea and vomiting—Are undoubtedly often of reflex origin and due to increased muscular tone in the gastric walls. These symptoms may be associated with an extraordinary degree of hunger due to gastric hypermotility.

Colicky pains—Are usually due to areas of spasticity in the intestine behind, which gas is liable to collect, causing distension and pain.

Spastic constipation—Is due to the same cause, and is usually accompanied by colicky pains.

Intestinal stasis—Is due to a retardation of the intestinal contents as a result of spastic conditions in the bowel.

The Treatment of Rheumatism and Gout by Hypodermic Injections of Salicylic Acid

The Medical Press and Circular, December 31, 1919

SEJOURNET recommends the hypodermic injection of a 1 in 1,000 solution of salicylic acid in articular rheumatism and gout. He prepares his solution by pouring a litre of hot water on one gramme of the acid. The usual dose is 1 c.c., containing one milligramme of the acid. The injection should be given subcutaneously in the neighbourhood of the affected joint, as near as possible to the inter-articular line. A single injection is usually sufficient, but, if necessary, it may be repeated on three successive days. A fourth injection is rarely needed.

The remedy is not as effective in chronic rheumatism as in the acute form, though some improvement may always be expected. Several injections should be made around the joint.

Muscular rheumatism is particularly amenable to the treatment. The injection should be made as near as possible to the painful spot. Relief is often instantaneous. Ordinary sciatica also yields to injections over the point of emergence of the nerves.

In acute gout 1 c.c. of the solution is injected over each affected joint.

The Death of Sir William Osler

THE death of the Regius Professor of Medicine at Oxford has removed one of the most notable physicians and "hospital men" in the English-speaking world. It was only a very few months ago that the homage of his own profession was paid him on his seventieth birthday in a well-conceived presentation at the Royal Society of Medicine, and few can then have suspected that his span of useful activity for his fellow-men was drawing so near to its close. Professor first of all, at the early age of twenty-five in McGill University, Montreal, he moved from there to Philadelphia in the same capacity, but it was his next professorship—at the then newly-constituted Johns Hopkins Hospital and University, Baltimore—that set the seal on his reputation both as teacher and physician. In 1905, he came to Oxford to succeed Burdon Sanderson, and from that time onwards British medicine has been the richer by a ripe and experienced physician, a profound scholar, and pre-eminent teacher—while the Radcliffe Infirmary owes more to him than can easily be expressed. His own researches, though many and valuable, have not put him quite alongside, let us say, a Lister or a James Mackenzie, but in his power of stimulating his students to fruitful research, of encouraging and guiding them, Osler has, perhaps, been unequalled, or at least unexcelled in our time. His interest in and knowledge of medical history was such as alone to have distinguished him from the ordinary run of consultants, and another of his outstanding qualities was his humanity and his breadth of view. In him neither the heart ruled the head nor the head the heart. A just balance and a sterling sanity were things he seemed to achieve without effort, because they were the natural foundations of his personality.—*The Hospital*

The Cause of Eclampsia

The Dublin Journal of Medical Science, December 1st, 1919—PROFESSOR HASTINGS TWFDY, F.R.C.P.

THE writer noticed as early as 1913 that ordinary food becomes poisonous during pregnancy, and when in this condition gives rise to toxæmia and eclampsia. In the present paper he maintains that eclampsia is due to a deficiency of antibodies. Antibodies are concerned in the later processes of digestion. They become active shortly after birth, stimulated by an antigen present in the colostrum and early food of infants. They are provided to an extent far in excess of normal requirements, but are not unlimited in amount.

During pregnancy the antibodies are working on to fulfil a double rôle—their nor

and to deal with the albumen which is being constantly exuded into the maternal blood from the ovum. That ovum protein is present in the blood is abundantly proved by the Abderhalden serum test for pregnancy, and its toxic effect is noted through all degrees of toxæmia from morning sickness to eclampsia.

Should food be taken in excess or should the exuded ovum albumen increase beyond certain limits, the amount of antibodies may not be sufficient to detoxicate both and toxæmia may result. In such circumstances a low diet (such as milk) will reduce the total amount of antibodies necessary, and health may again be established. If this is not successful, absolute starvation as practised at the Rotunda Hospital, Dublin, may set free sufficient antibodies to deal with the foetal proteins. Should at any time a stationary condition of ill-health be established, there is nothing for it but to empty the uterus, and thus get rid of the continued exudation of foetal protein.

The above views explain much that was formerly obscure. It is now plain why multiple births are especially liable to eclampsia. Blood-letting, while it may relieve the immediate symptoms, also removes the antibodies and does not increase the chances of recovery. Free absorption of water and intravenous saline act by diluting the poison, but, since this is a protein substance cannot help much in its elimination. Similarly, sweating induced by various methods cannot get rid of the toxic protein substance.

Finally, the writer mentions the interesting fact that the semi-starvation incident to the war in Germany, while it increased the incidence of most diseases, brought about a marked decrease in the number of cases of eclampsia.

The Rôle of Fat in the Etiology of Infantile Marasmus

The Glasgow Medical Journal, November, 1919
—MAJOR H. S. HUTCHINSON, I.M.S.

THE writer defines infantile marasmus as a disease in which there is no constitutional affection or local organic disease present to account for the wasting, which is the characteristic symptom. As to its etiology little is known. Various theories have been put forward by writers such as Holt, Still, Czerny and Keller, none of these satisfactorily explain the condition, and it is generally held that in marasmus there is a deficient absorption of fat. The present paper deals with this view, viz., whether there is or is not any defect in the absorption of fats in infantile marasmus.

The food fat may be lost to the child in one of three ways—

1. Imperfect digestion of fat through pancreatic insufficiency, or occlusion of the bile ducts.

2. Through the passage of excessively large motions containing normal amounts of fat.

3. There may be true defective absorption as indicated by an increased percentage of digested fat in the fæces.

These three possibilities were investigated as follows—

1. *Digestion of fat*—By estimating the percentage of neutral fat in the fæces, and comparing with the total fat present in an equal number of healthy and marasmic children.

2. *The relationship of the fæces weight to the fat output*—By this means it was shown that the slightly larger motion of the marasmic child accounted for the increased fat output in that disease.

3. *The question of true defective absorption of fat*—This would show itself by an increased percentage of fat in the fæces. It was found, however, that there is only a very slight increase of fat in the fæces of marasmic children.

The conclusions arrived at are as follows—

1. There is no evidence to show that in infantile marasmus a defective absorption of fat is a factor in its causation either through imperfect digestion, passage of unduly large motions or through a defect in the absorptive capacity of the bowel wall.

2. Saponification of fats does not lead to a loss of fat through defective absorption. A high percentage of insoluble soaps in the fæces fat simply upsets the soap-fatty acid balance, and since the insoluble soaps possess feeble hydrophilic properties, constipation results.

3. The iodine value of the fæces fat is lower than in health, and this suggests that in marasmus there may be a qualitative error in absorption rather than a quantitative one.

4. The alkaline reserve of the blood in marasmus is lower than in health, but the diminution is small, and does not suggest an acidosis of any consequence. There is no evidence that there is a lower alkaline reserve on a whole milk diet than on a weak fat milk, so that apparently in marasmus there is not an incomplete metabolism of fat.

The Hysterical Element in Organic Disease and Injury of the Central Nervous System.

Lancet, March, 3, 1919 p. 369—LIEUT.-COL. A. F. HURST, F.R.C.P. and MAJOR J. L. SYMNS.

THE writers state that there are few symptoms of organic disease, which are not liable to be aggravated and perpetuated by suggestion. As a result of their four years' experience with soldiers they conclude that it is necessary to look for an hysterical element in almost every case, and make a point of testing every case, where there is any conceivable possibility of the presence of

such a factor, by the only means possible, the effect of psycho-therapy

DISSEMINATED SCLEROSIS

In this disease for instance, signs of organic disease of the pyramidal tract, such as an extensor plantar reflex, ankle clonus exaggerated knee-jerks, and absent abdominal reflex, may be present in a patient with no symptoms of paraplegia, though they may be accompanied by such early symptoms as impaired vision, or unsteadiness of the hands. These physical signs are usually accepted as absolute proof that the disease has involved pyramidal tracts.

It should, however, be borne in mind that many patients, especially women suffering from disseminated sclerosis, are abnormally prone to suggestion. When the lesion of the pyramidal tracts in such an individual becomes sufficient to cause stiffness and weakness of the legs the latter may give rise to the idea of paralysis and hysterical paraplegia may appear. Under various forms of treatment, accompanied by the suggestion of the possibility of a cure, the hysterical element may disappear, leaving behind the slight stiffness and weakness which were present before the onset of the hysterical symptoms.

This would appear to be the chief explanation of the remarkable periods of improvement so characteristic of disseminated sclerosis. The same remarks apply to the slight impairment of vision first experienced, and which may lead by suggestion to almost total blindness. This condition, too, may show improvement spontaneously, or apparently from treatment.

The remittent character of the symptoms of disseminated sclerosis may also be explained on the hypothesis that the rapid development of new areas of sclerosis in the central nervous system may by compression throw neighbouring nervous tissue out of action which later, as a result of contraction of the diseased area may be released from pressure and recover its functions.

TABES

In a manner similar to that in disseminated sclerosis signs of tabes dorsalis may develop before symptoms. For instance it is common to find ankle-jerks and knee-jerks lost or impaired, with impairment of the vibration-sense over the bones of the legs, in patients who have sought advice for gastric or other crises, impaired vision, impotence or disturbance in micturition which are due to early tabes, but who have so far had no atony or other symptoms of disease of the posterior columns. In such cases the hysterical part of the symptoms disappear under the influence of psycho-therapy.

The improvement in the gait of tabetic patients from Frenkel's method is largely the result of suggestion, and not solely due to

educating the patient to use his eyes to help his deficient muscle-sense.

FRIEDRICH'S ATAXIA

This used to be considered one of the nervous diseases in which very little can be done in the way of treatment.

A case is quoted by the writers of a private who developed all the typical symptoms: extreme inco-ordination, Romberg's sign, kyphosis, high plantar arches, absent deep reflexes, etc., and who had so improved after a week's treatment by psycho-therapy that he became a competent porter.

INJURIES AND ACUTE DISEASES OF THE BRAIN AND SPINAL CORD

Just as in the case of the diseases mentioned so may injuries and acute diseases of the spinal cord give rise to a hysterical perpetuation of signs and symptoms originally due to blocking of nerve impulses by the lesion or lesions, but afterwards when the initial changes have to a large extent cleared up, perpetuated either by auto-suggestion on the part of the patient, or unconscious hetero-suggestion by the physician. In such cases the initial incapacity gives rise to the idea of permanent incapacity, and the paralysis remains complete although the proportion of the organic to the hysterical element becomes steadily less. "A condition may thus occur, which is primarily organic but is ultimately hysterical. Everything of organic origin may disappear or the residual lesion may be sufficient to produce organic physical signs without any loss of function or both organic and physical signs and some loss of function."

DIAGNOSIS

The symptoms and physical signs which are supposed to help in distinguishing between organic and hysterical paralysis fall into three groups—

1. Phenomena which afford visible and conclusive proof of structural changes in the nervous system such as optic atrophy, optic neuritis and abnormal cells in the cerebro-spinal fluid.

2. Signs which are entirely beyond voluntary control, such as the Argyll Robertson pupil, the reaction of degeneration and loss of knee and ankle-jerks.

3. Those signs which can be imitated by any one who has studied them but which would not be likely to be the result of auto-suggestion or be simulated by an ordinary malingerer.

The two first groups are conclusive proof of the presence of organic disease. The signs in the last group lose much of their significance when the hysterical paralysis is followed organic paralysis is the characteristic of the hysterical paralysis. As suggested by the organic paralysis, the writers have seen cases.

paralysis followed by hysterical paralysis, in which the platysma, pronation and fan signs of Babinski combined flexion of the thigh and pelvis ankle clonus, and various other signs disappeared rapidly under psycho-therapy

TREATMENT

The treatment may be summed up in the words suggestions, persuasion and re-education. The use of psycho-therapy and re-education should be resorted to from the earliest possible moment. In organic hemiplegia, for instance, there is no reason why passive movements should not be commenced on the day of onset, and as soon as the patient's general condition permits, he should be encouraged to attempt voluntary movements. If the hemiplegia is associated with aphasia, re-education of speech should be commenced at the same time. The same applies to other conditions such as acute poliomyelitis. Examples are given of the striking effect of psycho-therapy in cases of paralysis thought to be organic and lasting for months or even years.

Symptoms and Treatment of Sprue.

China Med J 1918 Nov Vol 32 No 6 pp 514-521—J B PATTERSON

PATTERSON practising in Korea considers that sprue is a serious and not uncommon disease in that country. He records eleven cases stating that he has himself been a sufferer from it. The commonly accepted view that sprue usually occurs after 40, being rarely seen under 35 is questioned by the author, who has suspected sprue in several children he has seen with prolonged sickness in which no definite diagnosis can be made. Although the disease is usually so insidious as to be years in declaring itself after the first infection it sometimes begins with symptoms so acute that it may be mistaken for dysentery or cholera. The cause of sprue is believed to be the yeast identified by ASHFORD (*Monilia psilosis* Ashford). The treatment is largely dietetic and has been greatly improved by the use of salvarsan and its substitutes and of sodium cacodylate in addition to emetin. The signs of improvement in the order of their occurrence are (1) a comfortable feeling in the abdomen after eating and a clean taste in the mouth, (2) gain in weight, and (3) a dark-coloured stool.—F E T

A Note upon the Modes of Infection in Bacillary Dysentery

Jl Roy Army Med Corps 1919 March Vol 32 No 3 pp 209-214—JOHN COWAN and F J MACKIE

WORKING in Alexandria in 1916, Cowan and Mackie investigated some of the methods by which the infection of bacillary dysentery was conveyed from one individual to another. Although their investigations were incomplete owing to the press of work, their data show that the source of infection was infected stools, and that the possible modes of infections were (1) water, (2) sand, (3) food, (4) flies, and (5) fingers. They lay little stress on the first four factors and consider that the personal equation requires further attention and investigation. The washing of hands after going to the latrines and before meals, though impossible in the field is generally possible in standing camps. Infected hands may convey the infection to an indefinite number of people, if employed in the cook

house or the dining room. They consider that direct personal infection is a factor that requires more attention than it has received in the past.—F E T

Migration of Parasites as the Cause of Anemia in Æstivo-Autumnal Malarial Infections.

Jl Experim Med 1919 April 1 Vol 29 No 4 pp 361-368 With 2 Plates—MARY R LAWSON.

THE author asserts (a) that the anemia of malaria is due to the fact that each parasite destroys several red blood corpuscles (b) that deficiency of hæmoglobin disproportionate to the loss of red corpuscles is due to the fact "that there is always a partial loss of hæmoglobin in certain of the surviving corpuscles due to parasitic action" (c) that "migration" of parasites occurs in all æstivo-autumnal infections, and (d) that the many observers who have observed parasites free in the blood have failed to interpret their significance.

Treatment of Malaria by Special Technique.

Plus Ultra Madrid 1918 Oct Vol 1 No 4 p 186 [Summarised in *Jl Amer Med Assoc* 1919 May 3]—J M CASARES Y BISCANZA

By this special method quinine (0.20 gramme) combined with arsenic is given in a large quantity of water at the beginning of the cold stage when the internal organs are hyperemic and absorption from the stomach is rapid. As the cold passes into the hot stage the blood rushes to the skin so that the copiously-absorbed quinine-water is diffused through the bloodvessels as effectually as if it had been injected, and moreover at the right moment for catching the young merozoites.

The originator of this ingenious method claims to have cured 897 out of 1072 cases of malaria in a single course of 4 doses. 129 cases required a second course and 46 a third, these being cases where the previous course or courses were not properly accomplished. The completeness of the cure was verified a year afterwards in 640 cases.

Malaria—R McCarrison and J W Cornwall publish an elaborate investigation on the action of Quinine the conclusions arrived at being as follows (1) The usual salts of quinine employed for intravenous medication are dangerous to life if given in large doses (2) The respiratory centre is more gravely affected than the cardiac centre. The acid hydrobromide is less noxious in its action on the respiratory centre than the hydrochlorides of quinine (3) All the salts of quinine employed caused a profound fall of blood pressure not accompanied by a cessation, or even much diminution in the strength, of the heart's beat (4) The fall of blood pressure is usually recovered from in four or five minutes, but the period of cardiac vascular depression may last for a considerable time (5) The dilution of the quinine with a large volume of salt solution does not compensate for its depressor action nor does dilution with 6 per cent gum arabic solution (6) Intravenous injections of quinine should be given very slowly. They should be administered with great caution when the general condition of the patient is bad and when the blood pressure is low. All such injections should be controlled by blood pressure observations (7) Adrenalin given intravenously with the quinine is able to counteract to some extent the immediate and dangerous fall of pressure which may result from quinine alone. The authors consider that the intravenous employment of quinine should be reserved for cases of special urgency, that where possible the hydrobromide in doses not exceeding 15 grains should be used and the injection combined with not more than 0.3 cc of commercial solution of adrenalin in all cases where the blood pressure is under 100 mm. Quinine, the authors hold, is a

drug of the highest curative value in the treatment of malaria but it should be used only when the parasites are susceptible to its action, that is, when in the stage of sporulation and it should be suspended when blood examination shows this stage to have been passed—*The Prescriber*, Jan, 1920, p 35

Normal and Morbid Conditions of the Testes From Birth to Old Age in One Hundred Asylum and Hospital Cases

The British Medical Journal—December 6th,
1919 p 737—SIR F W MOTT, K B F, M D,
L I D, F R S, F R C P

SUMMARY

1 The testes were examined in 100 cases of deaths occurring at all ages from birth to 86, in London asylums and various civil and military hospitals. The fluid contained in the vesiculæ seminales was examined in a considerable number of these cases, and in a few of the cases—especially dementia præcox cases—the thyroid, adrenals, and pituitary glands were also examined.

2 The development of the testis from birth to puberty was studied in a number of cases, with the following results. At birth there is a large amount of interstitial tissue between the seminiferous tubules, the interstitial cells of Leydig are observable in great numbers and have the appearance of a gland; these cells contain a lipochrome substance like lutein and lipid granules. At four months the tubules are twice the size, the interstitial cells are hardly visible and there are no lipid granules seen. At eleven there is very little change in the size of the tubules and the interstitial cells are only discernible by examination with an oil-immersion lens (resting stage). There is little or no interstitial lipid seen. There are commencing evidences of nuclear activity and karyokinetic figures but no spermatids nor spermatozoa.

At fifteen (puberty) the tubules are closely approximated and all stages of active spermatogenesis are observable. There is abundant interstitial lipid, and lipid granules are seen in the cells of Sertoli, but not so abundant as in the adult.

3 Cases dying before puberty of chronic diseases—for example, tuberculosis, congenital syphilis, and chronic morbus cordis—show appearances of complete arrest of development of the seminiferous tubules. Probably Kyrle's view is correct, that arrested development of the tubuli seminiferi is a sign of deficient vital resistance to disease.

4 Normal spermatogenesis was studied in cases of death from shock caused by severe injuries. Active spermatogenesis is seen in all stages. The interstitial cells contain abundant lipid and the spermatogonia, and especially the Sertoli cells lining the tubules, are filled with fine lipid granules.

5 Where there are sheaves of spermatozoa these granules in the Sertoli cells are less numerous. The immature spermatozoa dive into the Sertoli cells and there acquire their tails which consist almost entirely of lipid lecithin and some cholesterolin.

6 Evidence is given to show that the lipid granules seen in the interstitial tissue and in the cells lining the basement membrane of the tubules constitute the raw material from which the nucleic acid, necessary for active nuclear proliferation and spermatogenesis is formed. These lipid granules give the oxidase reaction owing to the presence of traces of unsaturated fatty acid. Decomposition and recombination processes are brought about by the catalytic action of the iron of the cell nucleus upon the oxidase, causing molecular oxygen O_2 to be converted into free atomic oxygen $O \cdot$ on the surface of the granules.

7 Reasons are given for supposing that these lipid granules are derived from the lipid store in the cortex adrenalis. Elliot's work, showing that the lipid content of the cells of the cortex adrenalis is diminished

in microbial intoxication, is confirmed. However much it is diminished on this account, the lipid granules in the testes are not appreciably so. This may explain the fact, so frequently observed in this inquiry, that prolonged microbial toxæmia does not arrest spermatogenesis. It seems as if the lipid substance in the testes acted not only as the phosphorized raw material of nuclear activity, but as a protective barrier to the effects of circulating microbial poisons.

8 The spermatozoa in the vesiculæ seminales were observed alive and active eight hours after death in two cases, but the majority were dead. Examination of the seminal fluid from a large number of vesiculæ showed several important facts. In a healthy man the heads of the spermatozoa are stained by the basic dye, whereas in persons dying of various chronic diseases the majority of the spermatozoa are stained by the acid dye indicative of a death change. May not this indicate a survival of the fittest in the vesiculæ seminales, and a protective provision of Nature? The most marked degenerative changes in the spermatozoa were found in dementia præcox.

9 Whereas in 66 successive cases of general paralysis spirochætes were found in an emulsion of the brain spirochætes were not once found in 50 cases in which an emulsion of the testis was examined microscopically by dark ground illumination. This fact may be correlated with the fact that general paralytics unless the wives are infected, have healthy children.

10 The testes of a large number of general paralytics including four of the juvenile form, were examined. In not one of these cases was there a complete arrest of spermatogenesis. In many there was very active spermatogenesis and normal staining spermatozoa in the seminal fluid. A considerable proportion of the testes however showed strands and islands of completely atrophied tubules amidst normal tubules. Seeing that where this atrophy occurred islands of normal Leydig cells are seen, it must be concluded that the atrophy of the tubules was due to local obstruction of the vasa efferentia by gonorrhœa or syphilitic inflammation. In one case of juvenile general paralysis in which the secondary sexual characters had not developed the testes were infantile in development.

11 The testes of 22 cases of dementia præcox were examined. Three stages of regressive atrophy are described for convenience and brevity, but they all gradually merge from the earliest change in the biochemical reaction of the heads of the spermatozoa to a complete regressive atrophy of all the seminiferous tubules, so that the appearances of the organ as regards capacity for function in an adolescent was less than that observed in the decrepit dement of 86. Indeed, the testis of an old dement of 80 showed more microscopic evidences of virility than any one, even of the earliest cases, of dementia præcox. In one-half at least of the cases there was complete regressive atrophy. It is possible that this regressive atrophy of the testes may be correlated with a deficient vital resistance to infective disease, especially tuberculosis, from which the vast majority of these cases die.

12 The testes of 6 cases of imbecility and idiocy were examined, 5 of the 6 showed complete absence of spermatogenesis. Various other forms of mental and bodily disease at varying ages showed active spermatogenesis in spite of the most advanced and active tuberculosis, dysentery, bronchopneumonia, and gangrene of lung.

13 A full account of the microscopic and biochemical changes in the reproductive organs and the central nervous system in dementia præcox will form the subject of a future communication.

14 There is abundant evidence to show that whereas, on the one hand the degenerative changes in general paralysis obvious to the naked-eye in the brain are due to a chronic inflammatory reaction occasioned by spirochætal poison, on the other hand, dementia præcox is a primary nuclear degenerative process with no inflammatory reaction and no obvious ^{made later} changes of the brain. An attempt will be

to correlate the morbid biochemical changes observed in the reproductive organs with those in the brain in this disease

The Royal Air Force Memorial Fund Appeal.

Patron H R H PRINCE ALBERT

Chairman THE RT HON LORD HUGH CECIL

THIS Fund has been established to commemorate the services of the Royal Naval Air Service, the Royal Flying Corps, the Australian Flying Corps and the Royal Air Force during the war, by an organisation which will secure such lasting benefits to the officers and men of the Royal Air Force and their dependents as may be worthy of the greatness of the achievements commemorated

The Executive Committee of the Royal Air Force Memorial Fund, while taking care that their Memorial should distinctly commemorate the Royal Air Force, have equally been anxious to avoid mischievous overlapping, and have with that purpose put themselves into communication with the United Services Fund, with Lord Haig's Central Committee and with the Flying Services Fund

The objects the Executive Committee have decided to pursue are —

The erection of a commemorative monument to the fame of the Royal Naval Air Service, the Royal Flying Corps, and the Royal Air Force, including the officers and men who joined the force from Canada, New Zealand, South Africa and the other overseas Dominions

The establishment of places of residential education (like Trafalgar Homes) for the children of Airmen

The provision of bursaries available at approved schools

Generally, the provision of such treatment and the rendering of such assistance, as means may permit either directly or in co-operation with other organisations, to officers and men and their dependents, who may be disabled, sick, or otherwise infirm

All officers and men of the Flying Services, whether from the Dominions or from the United Kingdom, will, of course, be eligible for these benefits

These objects will be furthered by the Royal Air Force Memorial Fund, in the closest co-operation with the United Services Fund, and with Lord Haig's Committee, in accordance with the requirements of each particular object so as to prevent overlapping in expenditure, and the Executive Committee are con-

that they will both fittingly commemo-

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abundant generosity of those who honour the memory of the services and sufferings of the Royal Naval Air Service, Royal Flying Corps, the Australian Flying Corps and the Royal Air Force during the war

We know that in many hearts the memory of these services glows unforgettable To some it is intertwined with the agony of bereavement, to some it speaks of happy friendship and pleasant reminiscence, but by all who endured the anxieties and rejoiced in the glory of the Great War, not the least honoured place in the proud and thankful recollection of its chequered days is given to the skill and nerve of the brave men who first made war in the unbounded arena of the air, and to the ingenuity and industry of those who rendered that gallant fighting so fruitful to the cause of victory To all in whose minds these memories are enshrined we now appeal, of everyone whose heart quickens with pride or pain when he recalls the warfare in the air we ask that these sentiments of patriotism and of affection shall now be shown in a liberality not unworthy of their high temper, and that he will join with us in raising a lasting Memorial which shall carry down to a remote posterity the shining tradition of the Royal Air Force in the war, of its fine courage and its great renown

Inquiries, donations and subscriptions should be addressed to —The Secretary, Derek McCulloch, Esq, 7, Caxton Street, Westminster, S W 1

Signed —

ALBERT
HUGH CECIL
HUGH M TRENCHARD
J M SALMOND
A V VYVYAN

SUB-ASSISTANT SURGEON LEKHRAJ SINGH has found that intravenous injections of a solution of mercuric chloride in distilled water—half a grain in 2 cc—are effective in cases of syphilis and oriental sore Also that a solution of sodium iodide 8 per cent, can be readily sterilised by boiling, before use, in cases of late syphilis He finds that chloroform is an admirable disinfectant for hypodermic syringes

Reviews.

DISEASES OF THE NOSE AND THROAT—By HERBERT TILLY, B.S. (Lond), F.R.C.S. (Eng), Surgeon, Ear and Throat Department, University College, London, etc. Fourth Edition. Publishers, H K Lewis & Co, Ltd. Price 25/- net.

IN this volume are found the author's own views and methods of treatment, the result of

his twenty years' practical experience. He has found it necessary to rewrite the chapters on intranasal treatment of suppuration in the frontal sinuses, the technique of enucleation of the tonsils, and the large subject of endoscopy of the lower air passages, and of the œsophagus. New chapters have also appeared on certain affections of the trachea and œsophagus. The book is one of Lewis' well-known "Practical Series," and consequently symptoms, diagnosis and treatment are fully discussed. The volume is such a well known one that it is only necessary to mention this new and up-to-date edition.

FRACTURES, DISLOCATIONS AND ARTIFICIAL LIMBS—By JOHN A. C. McEWEN, M.B., Ch.B., D.Sc. Publishers, Macchese Jackson & Co., Publishers to Glasgow University.

THIS is a small handy volume which gives guidance in the selection of methods of treatment of fractures and dislocations. The most suitable forms of treatment, including splints for individual fractures, are described and figured in detail.

Compound fractures are fully dealt with, and the lessons of the war are utilized in the methods of preventing sepsis and loss of life and limb. There is a specially useful section, discussing amputations and the fitting of suitable artificial limbs, in this is given the conclusions arrived at in the Princess Louisa Scottish Hospital for limbless sailors and soldiers as to which amputations yield the most useful stumps, and the type of artificial limb most useful for the stumps. The book will be found a most useful one for every medical man.

THE PRINCIPLES OF GYNÆCOLOGY: A MANUAL FOR STUDENTS AND PRACTITIONERS—By H. BLAIR, B.S., M.D., etc., Gynæcological Surgeon, Royal Infirmary, Liverpool. Third Edition. Publishers, Baillière, Tindall and Cox. Price 38/- net.

THE second edition of this work was published in 1917, and already a third edition is called for, which speaks for itself. A considerable portion has been entirely rewritten, much fresh material has been added, and many new illustrations have appeared. The excellence of the illustrations, which are very numerous, is a pleasing feature of the book. The writer's own routine methods of operative procedure are described, a much better system than the usual one of puzzling descriptions of other authors' operations. Certain important facts in connection with internal secretions and calcium metabolism are dealt with in appropriate places, but no special chapters have been set apart for this subject, in which the writer is specially interested.

HANDBOOK OF GYNÆCOLOGY—By BETHEL SOLOMONS, B.A., M.D., F.R.C.P. Gynæcologist, Mercess Hospital, Dublin, etc. Publishers, Messrs Baillière, Tindall and Cox. Price 10/6 net.

It is pleasant to see a small and handy volume, quite big enough for the student

and complete in detail. Its perusal soon gives the impression that the work is the outcome of prolonged experience, and is largely the outcome of clinical lectures to students. It is well illustrated. The general practitioner will find this handbook of great help as we know of no more practical work, but it will be of greater assistance to the student, who is unnecessarily burdened with huge volumes. One is a little surprised to see catheterization of the bladder put down as an alternative to normal micturition prior to a gynaecological examination.

HANDBOOK OF ANÆSTHETICS—By J. STUART ROSS, M.B., Ch.B., F.R.C.S.E., Lecturer on Practical Anæsthetics, University of Edinburgh. Publishers, E and S Livingstone, Edinburgh.

THIS is a small and compact volume of 207 pages with chapters on local and spinal anæsthesia and on intratracheal anæsthesia. The book deals with chloroform, ether, nitrous oxide, nitrous oxide and oxygen and ethyl chloride, and different mixtures. It deals with everything required by the anæsthetist. That "good anæsthesia is absolutely vital to good surgery" is perhaps not yet fully appreciated, and this work will be of infinite value to both surgeon and anæsthetist.

The first four chapters are devoted to an account of the forces which modify the physiology of the patient during an operation under an anæsthetic.

CHILD WELFARE AND THE TEACHINGS OF CERTAIN DENTISTS, SCHOOL MEDICAL OFFICERS, MEDICAL OFFICERS OF HEALTH AND OTHER MEDICAL MEN—By J. SAM WALLACE, D.Sc., M.D., L.D.S., formerly Dental Surgeon, etc., London Hospital. Publishers, Baillière, Tindall and Cox. London. 5/- net.

THIS small volume deals with a subject very much, to the fore in all countries, viz., child welfare, with special reference to oral hygiene. It includes chapters on the principles of dietetics, the duty of the State towards the early environment of the child, and oral hygiene. Stress is laid on the preventibility of dental caries by rational dietary, and how dental caries is the origin of a vast amount of disease. The subject is one of which doctors are too often ignorant, and the book will more than repay perusal.

DISEASES OF THE NOSE, THROAT AND EAR—By W. G. PORTER, M.D., F.R.C.S. (Ed.).

A MELANCHOLY INTEREST attaches to the third edition of this book. It is edited by Dr Logan Turner, of Edinburgh, as Major W. G. Porter, the author, was killed in France in 1917. To his old friends and colleagues, the present revision is due. The book has always, and deservedly so, been popular. The contents are well and compactly arranged, and the student and general practitioner will find in it all they are likely to require. The coloured plates appear to us to be particularly good.

MEDICAL GUIDE FOR INDIA AND BOOK OF PRESCRIPTIONS
—By E. J. O'MFARA, O.B.F., F.R.C.S., Lt-Col., I.M.S.,

THE avowed object of this book is to give practitioners and medical students in India a brief compact reference to questions arising in the course of their daily work. The book will undoubtedly prove of much value to Medical Officers, Civil Surgeons and Medical Practitioners. There is an immense amount of useful information, collected from many sources, in it, including a pharmacopœia and numerous prescriptions that have stood the test of time. Various clinical methods and dietaries are given and certain common surgical procedures including after-treatment of operations are described. We think it is a mistake, in a work of this nature to introduce any reference to such highly specialised subjects as X-rays, electro-therapeutics, light therapy and tuberculin treatment as a little knowledge in these subjects may, indeed, be a very dangerous thing. On the other hand the section on urine testing, which is every-day work that must come to most, might be enlarged and more fully treated. We are sure the book will have a warm welcome and that before long few medical bookshelves in India will be without it.

SYMPTOMS OF VISCERAL DISEASE—By F. M. POTTER, F.R.C.S., M.D.

THIS book consists, as set forth on the title page, of a study of the vegetative nervous system in its relationship to clinical medicine. The object is to set up a new point of view in clinical medicine, and to provide a rational basis for the study of disease. The author's argument is that although the sympathetic or vegetative nervous system has been studied fully, anatomically and physiologically, yet physicians have not recognised its importance in clinical diagnosis and treatment. He shows that disease in one organ may, and often does, cause change in another organ through the medium of visceral nerves. Every important internal organ is connected, through afferent sympathetic and efferent spinal nerves, with definite skeletal structures, and if inflamed shows reflex sensory and motor actions, and that if the inflammation becomes chronic, important diagnostic trophic changes occur, such as altered sensation and muscle degeneration. For instance, chronic inflammation in the apex of a lung produces reflex degenerative changes in overlying skin, subcutaneous tissue and muscle, which influence percussion, palpation, and auscultation, and must be considered in the interpretation of findings.

The book contains much original, painstaking and suggestive work, and the author is to be congratulated on originating a new and fruitful line of thought. The book is especially welcome at a time when clinical medicine is tending to become overshadowed

by laboratory methods, and the patient lost sight of in the consideration of the disease.

DIAGNOSIS AND TREATMENT OF TROPICAL DISEASES—By E. R. STITT, A.B., M.D.

THE third edition of this book appears in less than a year after the appearance of the second edition, and indicates the demand there is for it. The text remains substantially the same as before. The volume is compact, concise and well arranged for reference, and the author is to be congratulated on having the subject-matter so thoroughly up to date. We note the misleading statement is made that liver abscess is a very rare condition in natives of India. This is probably based on Manson's unjustified inference from the rarity of the condition in the Native Army. In civil practice liver abscess is by no means uncommon in Indians and this is specially true of certain provinces. Few practitioners in Bengal with any length of experience have not seen considerable numbers of such cases. Treatment of this condition by aspiration without drainage which has undoubtedly given better results than any other method of treatment is hardly given its proper due. The author's view of quinine as a prophylactic against malaria is that the drug is inefficient and likely to lead to the development of a resistant strain of parasite in the blood. With this view an increasing number of medical men in the tropics are in sympathy. There are a large number of interesting and helpful illustrations. The book can be thoroughly recommended.

A TEXT-BOOK OF UROLOGY IN MEN, WOMEN AND CHILDREN—By VICTOR COX PEDERSEN, A.M., M.D., F.R.C.S., London, 1919. Henry Kimpton. Price 36s net.

How much is now known about the gonococcus, and the lesions to which it gives rise, the reader of this admirable work will easily learn. The minute directions for the diagnosis of the causes of a chronic urethritis—and these are many—and the clear description of the various remedial measures employed only require a note on detoxicated vaccine therapy to make this a complete treatise and thoroughly up to date.

Much space is devoted to physical treatment, for, as the author says, "Nearly every urologist who discourages physical treatment is not possessed of the necessary apparatus, and therefore cannot say from his own experience more than that he obtains good results from other methods," of which he adds that "when compared with drugs and chemical methods, their action is far more definite and more under control of the physician."

No operating surgeon should be without this work. All general practitioners will gain much by the hours spent in careful study of it and their patients will greatly benefit thereby. The chapters on cystoscopy and the

affections of the bladder and kidneys are very good indeed, but what the general practitioner most needs is what he will get in abundance—wise advice on how to relieve old cases of gleet and stricture

OUTLINE OF GENITO-URINARY SURGERY—By GEORGE GILBERT SMITH M.D. F.R.C.S. Philadelphia and London, 1919 W. B. Saunders Company Price 12s 6d nett

As its title implies, this work gives an outline of the surgery of the genito-urinary organs of both sexes. It is clearly written, and doubtless many who read it will be impelled to go further into the subject. As an epitome for students it will be useful.

THE VENEREAL PROBLEM—By E. T. BURKE D.S.O. M.R.C.S. London, 1919 Henry Kimpton Price 7s 6d nett.

This work is written for the lay reader, and all practitioners of medicine who have the misfortune to number among their acquaintances those whose ideas are still early-Victorian on the subject of venereal diseases, cannot do better than recommend them to read Captain Burke's exposition of the lamentable facts which so nearly concern all of us.

We think that he has overestimated the aid to be derived from treating the subject of sexual hygiene from the "moral" standpoint. This has been tried for many years, and—to judge from its effects—is not a very present help in time of trouble. To quote from his work: "The only methods of real value are artificial measures before the sexual act, and early preventive treatment before the onset of the symptoms." We note that he recommends the prophylactic use of Metchnikoff's ointment (33 per cent calomel), and of the condom. This last, he says that Ricord stigmatised as a "cuirass against pleasure, but a mere cobweb against infection", but it was a marquise who so criticised the tough membranes used in her day, and not Ricord, who believed in the efficacy of the "waterproof" and might easily have transposed the epigram. Burke also recommends the general use immediately after congress, of a 1—2,000 solution of potassium permanganate, which has been highly spoken of by Reid and Ruata, but we do not find mention of the good effects to be obtained by instilling a few drops of a 2 per cent solution of protargol into the urethra within half an hour after exposure to infection by the gonococcus.

RECONSTRUCTION THERAPY—By W. R. DUNTON. Publishers, W. B. Saunders Company.

This work which covers a very wide field, deals in a general manner with the rehabilitation, as industrial assets of persons disabled in body or mind, especially as a result of the late war. The writer lays great stress on work as an essential in treatment and in discussing the proper management of institu-

tions, he insists on the importance of appointing an "occupation director" to be in charge of this branch, which includes a vast choice of occupations, ranging from making knots in string to complicated crafts and arts. The occupation chosen must be suitable to the individual case, and it is very important that the patient's interest be aroused and maintained. It is further essential that the work be regarded as a therapeutic agent, and not from an economic standpoint. While dealing mainly with mental cases he includes the teaching of highly skilled movements, to persons with artificial limbs, the training of the blind and the re-education of the limbs in tabes and paralytic conditions. The book is written in attractive style, and combines much sound practical advice with a thorough grasp of theory. This work should be in the hands of all who are charged with institution management, or the care of mental cases.

AIDS TO THE MATHEMATICS OF HYGIENE—By R. B. FERRUSON. 5th Edition. Baillière, Tindall and Cox.

This useful little book comprises a large number of calculations, mainly physio-chemical. They are of an elementary character, and do not require the use of the calculus. They cover a wide range of subjects—the laws of gases, hygrometry, determinations of specific gravity and specific heats, problems of ventilation, calculations of rainfall and sewerage requirements, caloric values of foods, preparation of standard solutions, vital statistics, actuarial calculations, etc. It also explains the use of logarithms and the vernier.

The aim of the author has been to present these calculations in handy form for the use of public health students, and in this we think he has admirably succeeded.

Correspondence

"FLYING WORMS"

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR—I am glad to see that my short note on the "Flying Worms" kindly allowed by you to be published in the August number of the *Indian Medical Gazette*, has attracted the attention of some of my colleagues. Babu S. K. Sen, Assistant to the Imperial Pathological Entomologist, has asked me by a letter to send him some samples of those insects and I have done so. I believe that he, as a specialist, will inform us through the medium of your paper of the result of his investigations.

Babu T. N. Chakravarty has asked me to publish the names and addresses of the victims, and in compliance to his request I beg to say that the insects I have lectured are from the second son of Babu Surya K. Sub-Postmaster Barhamgunj, aged about 5 years, ing last July. The boy apparently did not look ill but used to pass two or three loose motions in the morning and the insects flying out of his usual meals consisting of rice, dal, fish, and so forth with good appetite. His elder brother and sister aged 14, are quite healthy. At the post office often, the Postmaster brought

and asked for a remedy. Now the thing is, that during last June I went to Kalamridha, ten or twelve miles from my place, on a call to treat a case of pneumonia, and eventually some gentlemen of schoolmaster and taluqdar class talked to me of such cases. I asked them to show me the insects, but they failed. From their description of the insects I could only gather that they belonged to the same class as were found in mangoes growing in this part of our district (Faridpur), and nothing more. But in the case of the son of the Postmaster I had the curiosity of seeing the insects personally before giving any medicine, and accordingly I gave him a small phial containing rectified spirit with necessary instructions for collecting and preserving them. Next morning the Postmaster returned my phial of spirit with three insects in it resembling those found in mangoes. I also tried my best to collect insects directly from mangoes but the season expired at the time. However, I shall try my best to collect them during the next mango season.

The remedy I gave the boy was saccharated lime solution and a mixture containing tinct nux vom, sodi bicarb inf quassia which did him good.

Yours etc,

AKSHAY CHANDRA DLY, L.M.P.

P. O. BAHAMGUNJ
Vil KUMARPUR
Dist FARIDPUR
23rd January, 1920

P. S.—An error has crept into your paper through mistake. I am not in LMS but in LMP.

A. C. DEY

INFLUENZA

To the Editor of THE INDIAN MEDICAL GAZETTE

SIR,—Having read several articles on "Influenza," I am induced to write about my experience of the cases that were treated by me. It is an admitted fact that the influenza epidemic is due to a mixed infection of different types of germs and consequently influenza patients also exhibit different kinds of symptoms according to the nature of the germs that are the causative agents in them.

Six peculiar cases of influenza with gastro-intestinal trouble were treated by me. They had all the symptoms of cholera except suppression of urine. On the second or third day of fever gastro-intestinal troubles commenced and the neglected cases turned into dysentery. None of the cases had any lung complications. This happened when cholera was prevailing in or about this station. I stood aghast when the first two cases were seen by me and thought for a while whether cholera and influenza germs go hand in hand with each other in the human system. When permanganate of potash, astringents, ipecac and opiates completely failed, I prescribed three minims of oil eucalyptus with gum acacia and aqua anise every fourth hour. With six or eight doses all the cases completely recovered, diarrhoea stopped and fever came to normal. I therefore recommend that oil eucalyptus may be tried in influenza cases with gastro-intestinal troubles.

This being a malarious district to a great extent, most of the cases that were treated by me had also malarial infection in them, either recent or old, and in order to eliminate malaria in such cases I prescribed "quinine sulph," which cured both malaria and influenza, or at least prevented the latter from turning serious. Most of my patients who were in the habit of taking quinine either by mouth or hypodermically did not get influenza though there were cases of influenza in their own houses. I am, therefore, strongly of opinion that quinine sulph acts both as prophylactic and curative in influenza epidemics.

Yours, etc,

D. BALARAMASWAMY NAIDU, L.M.P.,
Medical Officer, Sergada
(Ganjam District)

SERGAHA
23rd January, 1920

Service Notes.

To be O B E

T. LIFUT-COL. RAGHABENDRA ROW, I.M.S.
CAPT. DAIS RAJ RANJIT SINGH

To be M B E

CAPT. ARTHUR GEORGE BROWN, I.M.S.

MENTIONED for gallant and distinguished services rendered in connection with the Military operation at Aden.
LOULAFS, Lieut-Col. T. H., FRCS, I.M.S.
MACRAE, Major, T. Lieut-Col., I.M., M.B.

In modification of Government Notification No. 144, dated the 7th January, 1920, His Excellency the Governor in Council is pleased to grant Major J. C. G. Kunhardt I.M.S., privilege leave for five weeks, with effect from the 10th January, 1920, the date on which he was relieved by Lieut-Col. W. Glen Liston C.I.E., M.D., D.P.H., I.M.S. Major Kunhardt was on general duty from the 1st to the 9th January, 1920, both days inclusive.

LIFUT-COL. L. HASSELL WRIGHT, I.M.S., Civil Surgeon, Coorg, is granted privilege leave for one month and fourteen days, with effect from the 20th December, 1919.

MR. DINESHAW FRAMJEE Acting Apothecary, Virajpet, and Officiating Assistant Surgeon, Mercara, is appointed to hold charge of the current duties of the Civil Surgeon, Coorg, in addition to his own duties during the absence on privilege leave of Lieut-Col. E. Hasell Wright, I.M.S. with effect from the 20th December, 1919.

Under section 12 of the Code of Criminal Procedure, 1898, Captain A. P. Palit, I.M.S., Cantonment Magistrate, Sitapur, is invested with the powers of a magistrate of the 3rd class for such time as he holds the office of Cantonment Magistrate.

In Notification No. 283/II-90 dated the 16th January, 1920, posting Lieut-Col. A. W. R. Cochrane, I.M.S., as Civil Surgeon of Meerut, for the words "military duty" read "combined leave."

LIEUT-COL. A. W. TURE, FRCSI, D.P.H., I.M.S., Civil Surgeon, Ahmedabad, is granted, from the date of relief, privilege leave of absence for five months and nineteen days.

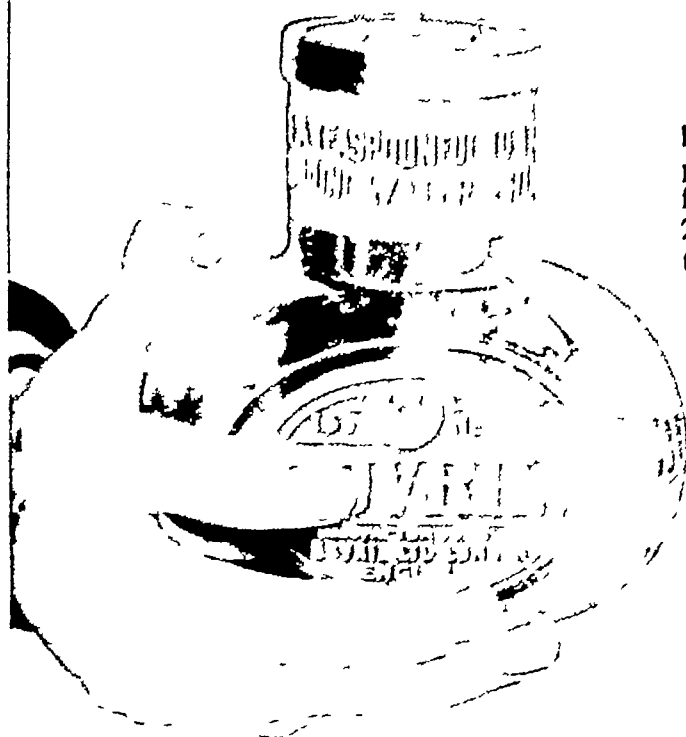
HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to appoint Khan Bahadur Assistant Surgeon A. K. Turner, L.M.S., to act as Chemical Analyst to Government, Bombay, during the absence on leave of Major B. Higham, M.B., I.M.S.

LIEUT. P. ST. C. MORE, I.M.S. Civil Surgeon, Sialkot, is granted leave for five and a half months, with effect from 1st May, 1920.

CAPTAIN J. H. HARPER NELSON, O.B.E., M.C., M.D., I.M.S., is appointed to be Professor of Materia Medica, King Edward Medical College, and Second Physician, Mayo Hospital, Lahore, with effect from the 24th November, 1919.

MAJOR R. H. BOTT, Indian Medical Service, is granted, subject to His Majesty's approval, the temporary rank of Lieut-Col. while holding the appointment of Consultant Surgeon, North-West Frontier Force, from the 25th May, 1919, to the 5th July, 1919.

LIEUT-COL. W. D. HAYWARD, M.B., I.M.S., Medical Store Keeper to Government, Calcutta, is granted combined leave *ex India* for 8 months, *i.e.*, privilege leave for 1 month and 4 days and furlough for the remaining period with effect from the 2nd January, 1920, under the terms of Articles 233 and 241, Civil Service Regulations.



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MAJOR C G HIRST IMS temporary Deputy Medical Store Keeper to Government Bombay, is appointed to officiate as Medical Store Keeper to Government Calcutta. Lieut Col W D Hayward granted leave with effect from the 2nd January 1920 and until further orders.

TEMPORARY CAPTAIN JAI GOPAL MUKHARJI is permitted, subject to His Majesty's approval to resign his commission with effect from the 30th November 1919.

SUBJECT to His Majesty's approval the services of temporary Captain Muhammad Amir Khan are dispensed with on account of physical disability with effect from the 15th September 1919.

INDIAN MEDICAL SERVICE.

THE undermentioned officers are granted subject to His Majesty's approval the acting rank of Lieut-Col while commanding the medical units noted against their names with effect from the dates or for the periods specified —

Captain J A Macdonald No 168 Indian Field Ambulance Dated 1st October 1918

Captain K R Batra No 31 Indian General Hospital from 6th October 1918 to 18th November 1918

Lieutenant P Verdon No 32 Indian General Hospital from 6th October 1918 to 17th November 1918

Captain C T Burke No 54 Indian General Hospital from 6th October 1918 to 23rd January 1919

SUBJECT to His Majesty's approval the undermentioned to be temporary Lieut., with effect from the date specified —

Kundan Jhamatmal Bhavnani MB Dated 18th September 1919

LIEUT-COL H ALSTON SMITH CIE MB., IMS Surgeon to His Excellency the Viceroy is appointed to officiate as Inspector General of Civil Hospitals Bihar and Orissa with effect from the date on which he assumes charge of his duties until further orders.

COL P C H STRICKLAND IMS (supernumerary) Inspector General of Civil Hospitals Burma is granted with effect from the 19th December 1919 combined leave for eight months i.e. privilege leave for six months under Article 260 Civil Service Regulations and the Government of India Finance Department, letter No 168 C S R dated the 24th February 1919 and there after leave on private affairs under Article 226 Army Regulations India Volume II

LIEUT COL J ENTRICAN IMS is appointed to be Inspector-General of Civil Hospitals, Burma sub *pro tem* with effect from the 19th December 1919 and until further orders.

LIEUT COL H A F KNAPTON IMS Superintendent of Matheran in the district of Kolaba is appointed under section 12 of the Code of Criminal Procedure 1898 to be a Magistrate of the 2nd Class in that district.

LIEUT COL G HUTCHISON IMS, Civil Surgeon from Gorakhpur to Dehra Dun

LIEUT-COL W M PEARSON IMS Civil Surgeon from Ghazipur to Gorakhpur

LIEUT-COL W YOUNG, IMS Civil Surgeon from Cawnpore to Lucknow

LIEUT-COL L G FISCHER IMS Civil Surgeon Dehra Dun privilege leave from the 15th February to the 31st March 1920

LIEUT-COL G T BIDDWOOD IMS Civil Surgeon Lucknow privilege leave combined with furlough on full average salary for a total period of eight months from the 10th February 1920

LIEUT COL W OS MURPHY, MB, BCh (RUI) DPH (Inc.) IMS Sanitary Commissioner for the Government of Bombay is granted with effect from the 1st April 1920 or any subsequent date from which he may avail himself of it, such privilege leave as may be due to him on that date combined with furlough for such period as may bring the combined period of absence up to eight months.

HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to grant Lieut-Col W M Houston, IMS Health Officer of the Port of Bombay privilege leave for six months combined with furlough for two months with effect from the 3rd April, 1920 or the subsequent date of relief.

HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to make the following appointments —

Assistant Surgeon P P Fernandez, LM&S., on relief by Major A J V Betts IMS, to be substantive *pro tempore* Civil Surgeon Panch Mahals from 26th November 1919 (afternoon)

Lieut-Col A F W King FRCSE, IMS., to be substantive *pro tempore* Civil Surgeon, Dharwar with attached duties with effect from 20th December 1919 (forenoon)

Captain J P Menezes IMS (TC) to act as Civil Surgeon Ahmednagar in addition to his military duties.

Captain S K Pillai IMS (TC) to act as Civil Surgeon Ahmednagar in addition to his military duties from the forenoon of 11th January 1920 to the forenoon of 19th January 1920.

Major K G Gharpurey IMS on reversion from the Military Department to be substantive *pro tempore* Civil Surgeon Surat.

INDIAN MEDICAL SERVICE.

TEMPORARY CAPTAIN SURENDRA MOHAN GHOSH is permitted subject to His Majesty's approval to resign his commission Dated 20th October 1919.

INDIAN MEDICAL SERVICE

Temp Lieutenant to be temp Captain

Pirojsha Merwanji Antia 24th November, 1918

NOTE.—In the notification in the London Gazette dated 14th November 1919 regarding the relinquishment of his temporary rank in the IMS by Captain L S Machado F.R.C.S.I. add the words "and is granted the rank of Captain after his name"

THE services of Major R E Wright MD IMS of the Bacteriological Department, are placed at the disposal of the Government of Madras.

THE names of the undermentioned Officers Ladies Warrant Officers Non-Commissioned Officers and Men are to be added to those brought to notice for distinguished and gallant services and devotion to duty by Lieut-General Sir W R. Marshall, KCB K.C.S.I., Commander-in-Chief Mesopotamian Expeditionary Force in his despatch of the 7th February 1919 [Published in the Supplement of the London Gazette dated 5th June, 1919 (No 31386)] —

INDIAN MEDICAL SERVICE

Berry Lt.-Col A. E. Bradfield, Maj (A.) Lt.-Col) E W C. OBE MB FRCS Edin Chambers Capt. (A.) Maj) R. A. MB Chandorkar T (Capt. B R., Chopra, Capt. (A.) Maj) P D, M.B., De, Capt J C MB, Gothaskar T (Capt S B., Hugo, Lt.-Col (T) Col) E V., CMG MD FRCS., VHS Kirwan, Capt (A.) Maj) E W OG MB Mukharji T (Capt J G., Quirke Maj (A.) Lt.-Col) M J., MB

THE names of the undermentioned Officers Ladies Warrant Officers and Non-Commissioned Officers have been brought to the notice of the Secretary of State for War for valuable services rendered on Hospital Ship during the War —

Dunn Maj C. L., Ind Med. Serv Williams Lt.-Col. H A., DSO MB., Ind., Med. Serv

EAST AFRICA.

THE name of the undermentioned Officer is to be added to those brought to notice for valuable and distinguished

services in the field by Lieut-General Sir J L Van Deventer, CB CMG, Commander-in-Chief, East African Force, in his despatch of the 20th January, 1919 [Published in the Supplement of the London Gazette dated 5th June, 1919 (No 31387)] —
 Illius Maj H W FRCS Ind Med Serv

ERRATA

THE names of the undermentioned Officers Ladies, Warrant Officers Non-Commissioned Officers and Men are to be added to those brought to notice for distinguished and gallant services by General Sir E H H Allenby GCB, GCMG Commander-in-Chief Egyptian Expeditionary Force, in his despatch of the 5th March 1919 [Published in the Supplement of the London Gazette dated 5th June 1919 (No 31383)] —

MacGregor Capt (T/Maj) R F D MC MB, Ind Med Serv Duncanson Capt A W Duncanson Capt (A Maj) G L MB Holdreth T/Lt G A Macmillan Maj (A/Lt-Col) J McC A MB, FRCS, Seddon, Capt A MB Gunapathya T/Capt C M, MB Otto T/Lt D S

THE name of the undermentioned Officer is to be added to those brought to notice for gallant conduct and distinguished services by General Sir G F Milne KCB, KCMG DSO, Commander-in-Chief, British Salonika Force in his despatch of the 9th March, 1919 [Published in the Supplement of the London Gazette dated 5th June 1919 (No 31385)] —

Harnett Maj (A/Lt-Col) W L Ind Med Serv

THE following acting promotions are notified, subject to His Majesty's approval —

Major J Husband Indian Medical Service to be acting Lieut-Col while commanding an Indian General Hospital Dated 18th September, 1919

Captain W E Brierley Indian Medical Service, to be acting Major while Registrar of an Indian General Hospital Dated 18th October 1919

Captain G N Gupta, Indian Medical Service (Temporary Commission), to be acting Major while Registrar of an Indian General Hospital Dated 8th July, 1919

Lieutenant L Sen, Indian Medical Service (Temporary Commission), to be acting Lieutenant-Colonel while commanding a Combined Field Ambulance from 9th June 1919, to 3rd July 1919

Captain R Ajinkya, Indian Medical Service (Temporary Commission), to be acting Lieutenant-Colonel while commanding a Combined Field Ambulance from 11th July, 1919, to 6th September, 1919

Major H M Wilson Indian Medical Service, to be acting Lieutenant-Colonel while commanding a Combined Field Ambulance from 7th September, 1919, to 3rd December, 1919

Captain R E Flowerdew, Indian Medical Service, to be acting Lieutenant-Colonel while commanding an Indian General Hospital from 11th September, 1919 to 11th October 1919

Major J Anderson Indian Medical Service, to be acting Lieutenant-Colonel while commanding an Indian Casualty Clearing Station, from 4th October 1919, to 12th October, 1919

Major J Anderson, Indian Medical Service, to be acting Lieutenant-Colonel while commanding an Indian General Hospital Dated 12th October, 1919

Captain R E Flowerdew, Indian Medical Service, to be acting Lieutenant-Colonel while commanding an Indian Casualty Clearing Station, from 13th October, 1919, to 15th October, 1919

Captain R E Flowerdew, Indian Medical Service, to be acting Major while holding an appointment as Deputy Assistant Director of Medical Services Dated 17th October, 1919

Captain J E Richardson, Indian Medical Service, to be acting Major while Registrar of an Indian General Hospital Dated 8th October, 1919

Major F T Thompson, Indian Medical Service, to be acting Lieutenant-Colonel while commanding an Indian General Hospital Dated 3rd November, 1919

Lieutenant-Colonel C Hudson, DSO, Indian Medical Service, to be acting Colonel while holding an appointment as Assistant Director of Medical Services Dated 20th October, 1919

Captain J B Vaidya, Indian Medical Service, to be acting Major while Registrar of an Indian General Hospital Dated 1st November, 1919

Captain Denys F Murphy, Indian Medical Service, to be acting rank of Lieutenant-Colonel while commanding a Casualty Clearing Station Dated 11th November, 1919

Major P F Wernicke, Indian Medical Service, to be acting Lieutenant-Colonel while commanding a Combined Field Ambulance Dated 18th November, 1919

Major H B Scott, Indian Medical Service, to be acting Lieutenant-Colonel while commanding a Combined Field Ambulance Dated 6th December, 1919

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 Manual of Obstetrics for the Use of Students and Junior Practitioners By O St Moses, MD, CM, DSc., FRCS, FRS (E) Major, IMS, Bengal Publishers, J and A Churchill, London 1920
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 Physiology of the Central Nervous System and Special Senses By N J Vezifdar, LM & S 3rd edition Messrs Govind & Co, Bombay, 1920
 Notes on the Open Air Treatment of Pulmonary Tuberculosis in the Madras Presidency
 Malaria Bureau Reports Federated Malay States Vol 1 1919
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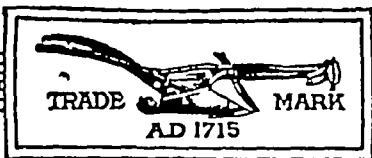


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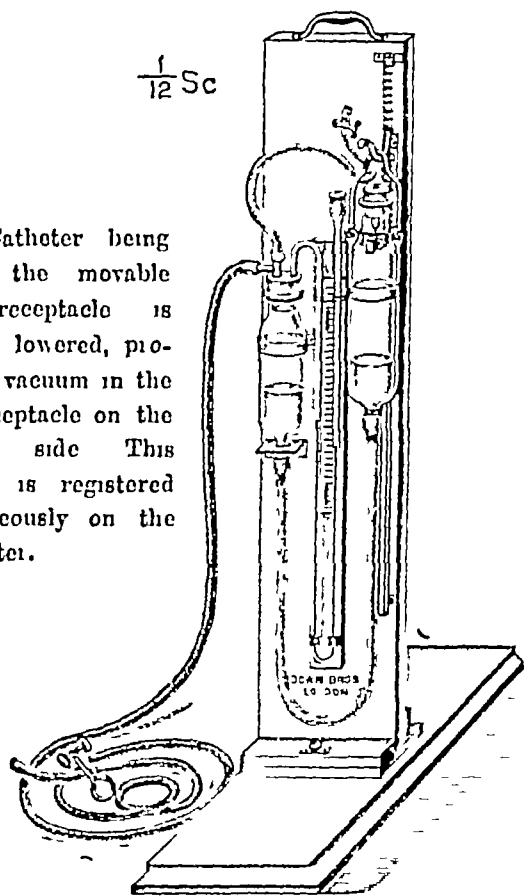
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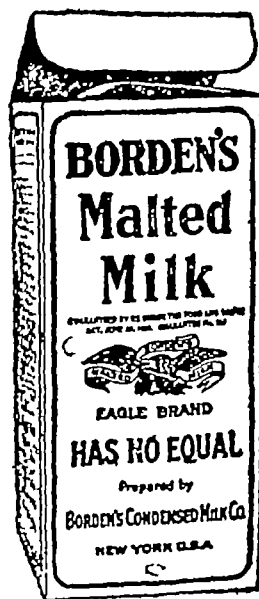
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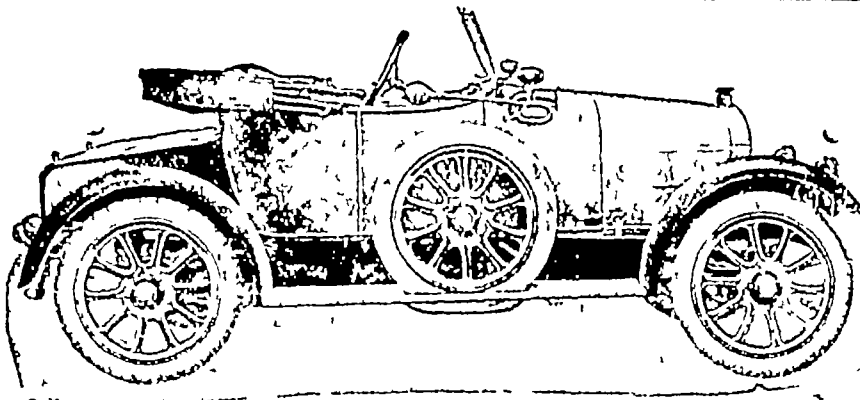
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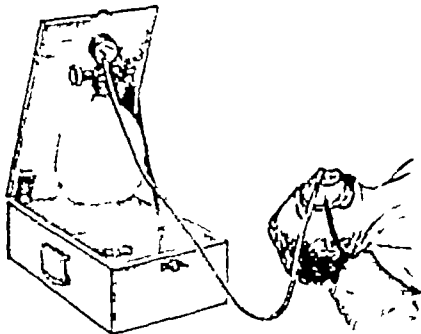
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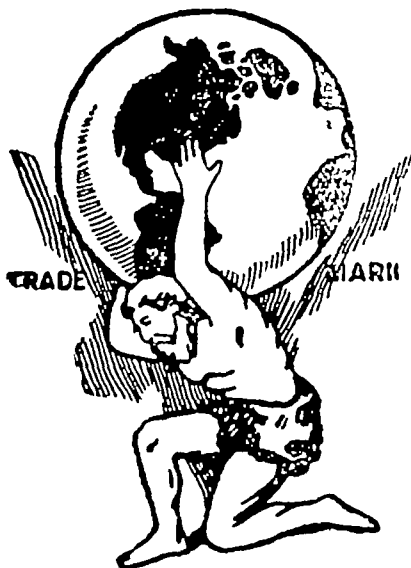
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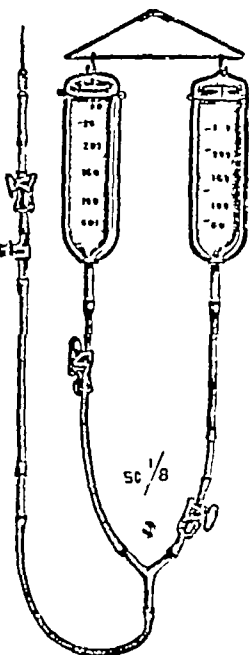
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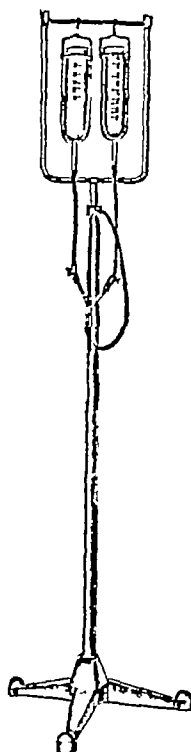
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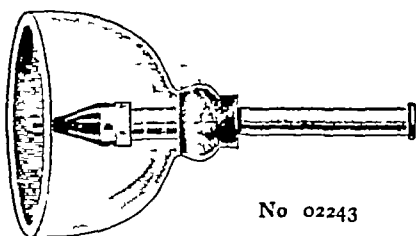


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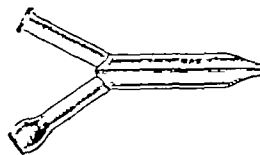
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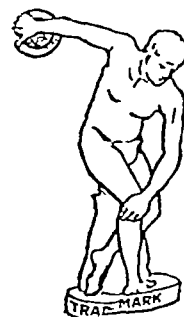
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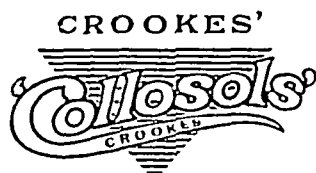
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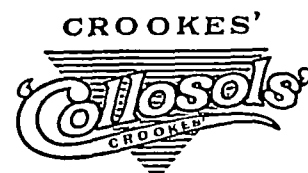
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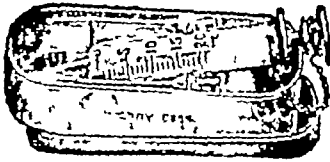


Fig 1253

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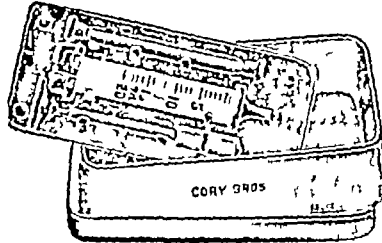


Fig 1251

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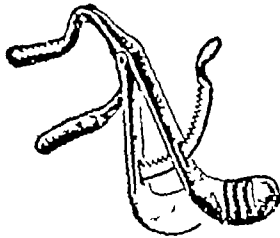


Fig 1188

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Fig 1200
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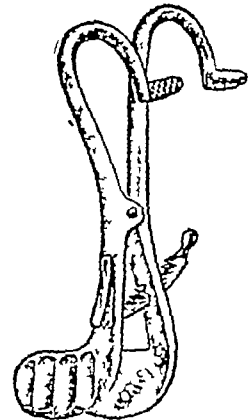
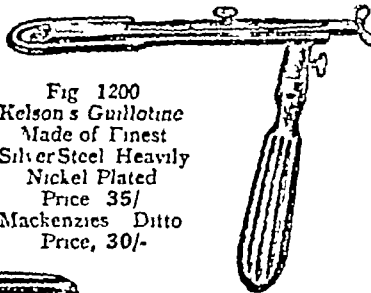


Fig 1185

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Fig 1209

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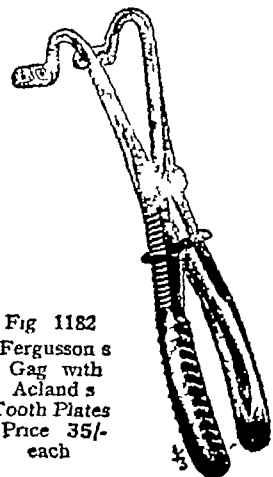


Fig 1182

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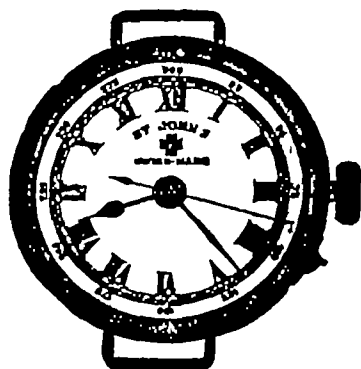
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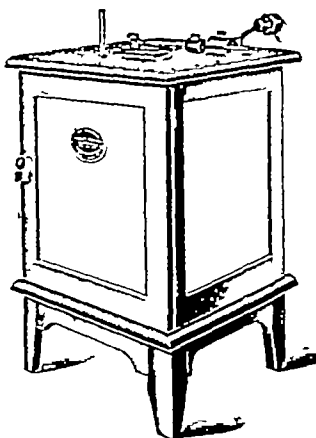
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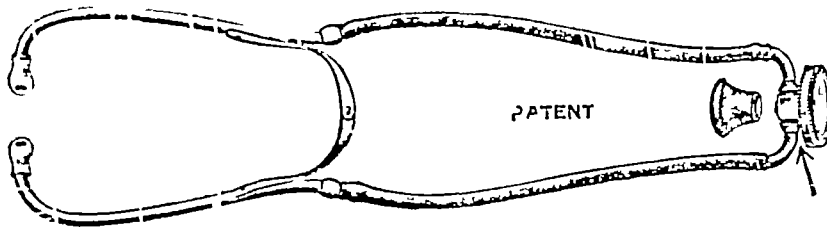
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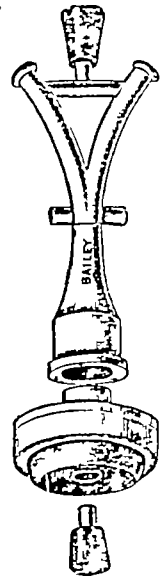
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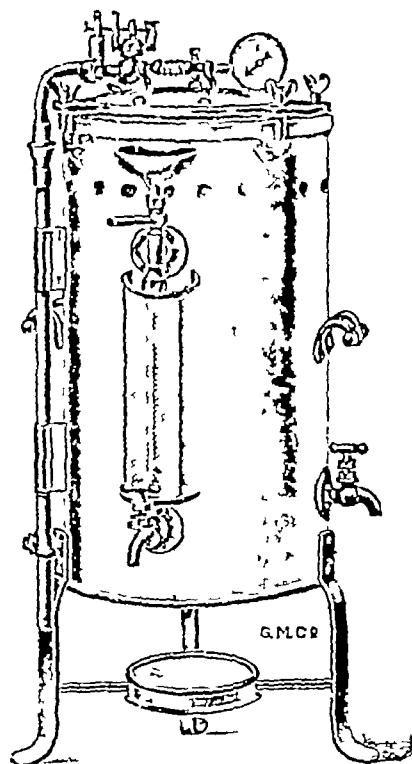
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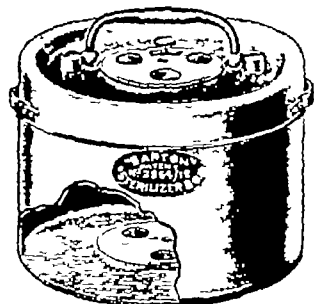
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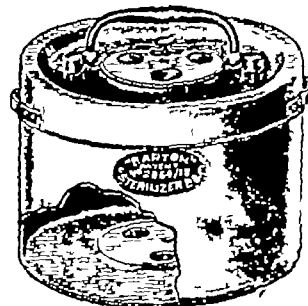
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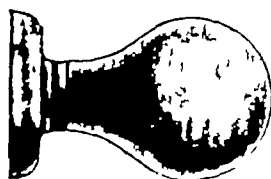
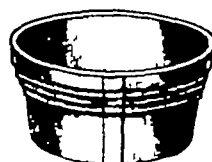
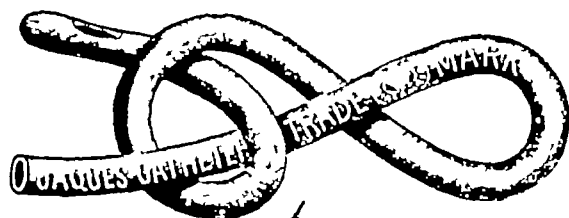
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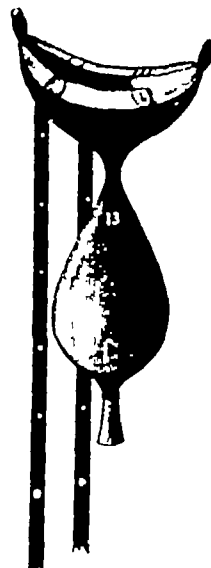
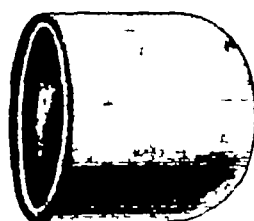


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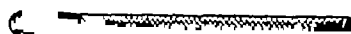
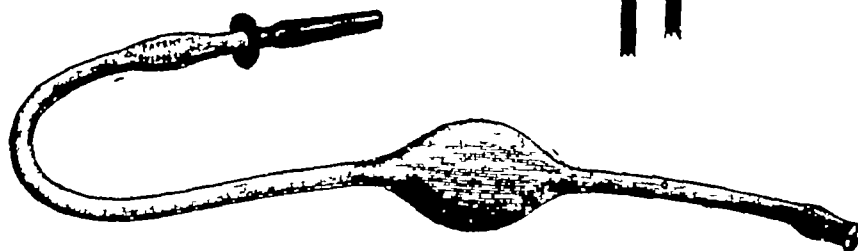
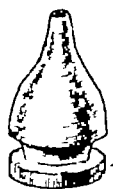


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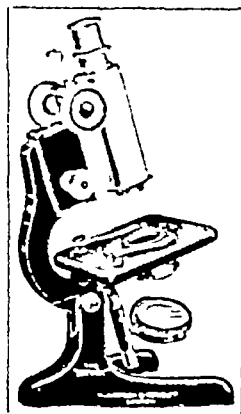
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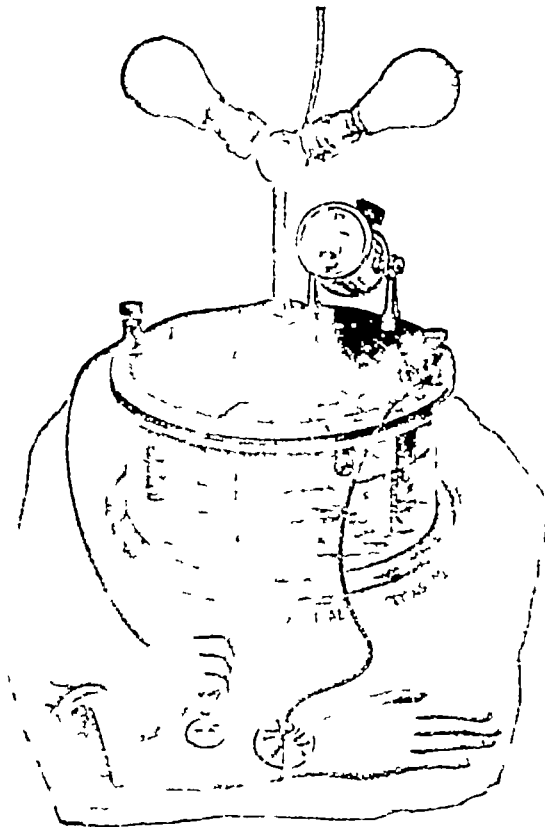
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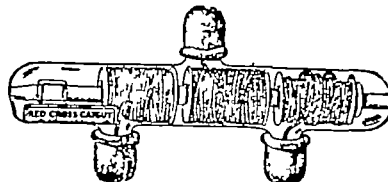
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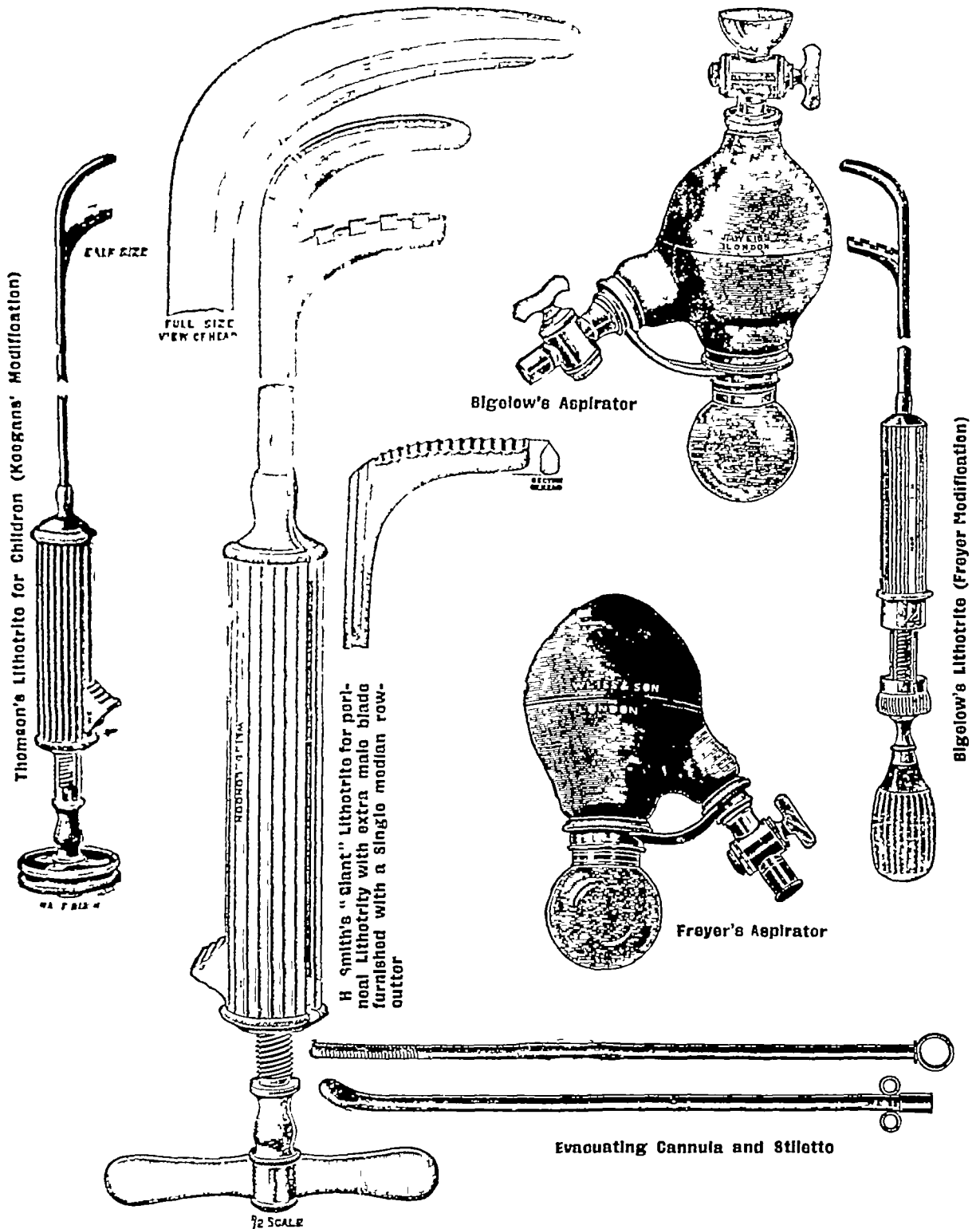
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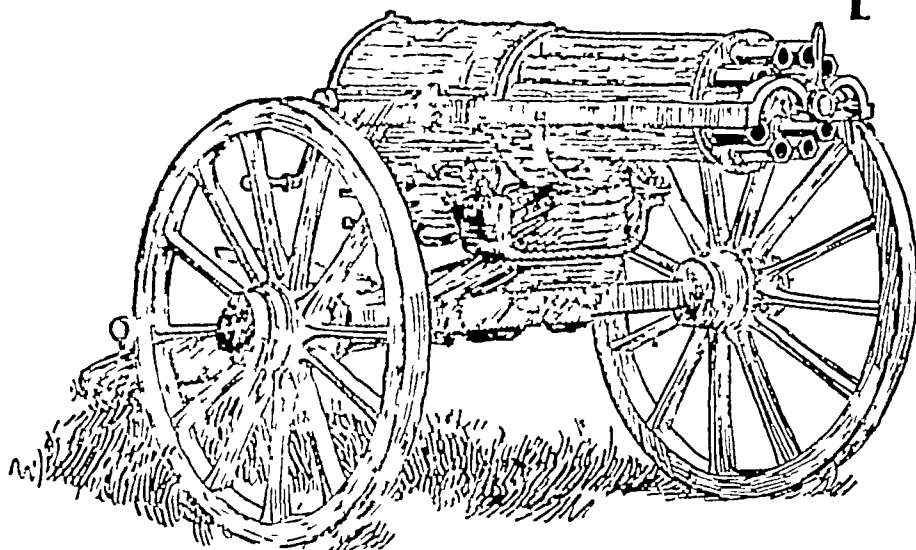
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An illustration such as this enables one to realize that the inter-relationships of the glands of internal secretion are so many and so complex that it is often advisable to give the product of one gland for the effect it will have upon another gland, in other words, its hormone effect.

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"With polyglandular therapy I have not had very much experience, but since I have been using the mixture called Hormotone I have had considerable success in those cases just referred to as benefited by pituitary." Leonard Williams (*Discussion on Therapeutic Value of Hormones*, *Proc. Roy. Soc. Med.*, London, Jan 20, 1914).

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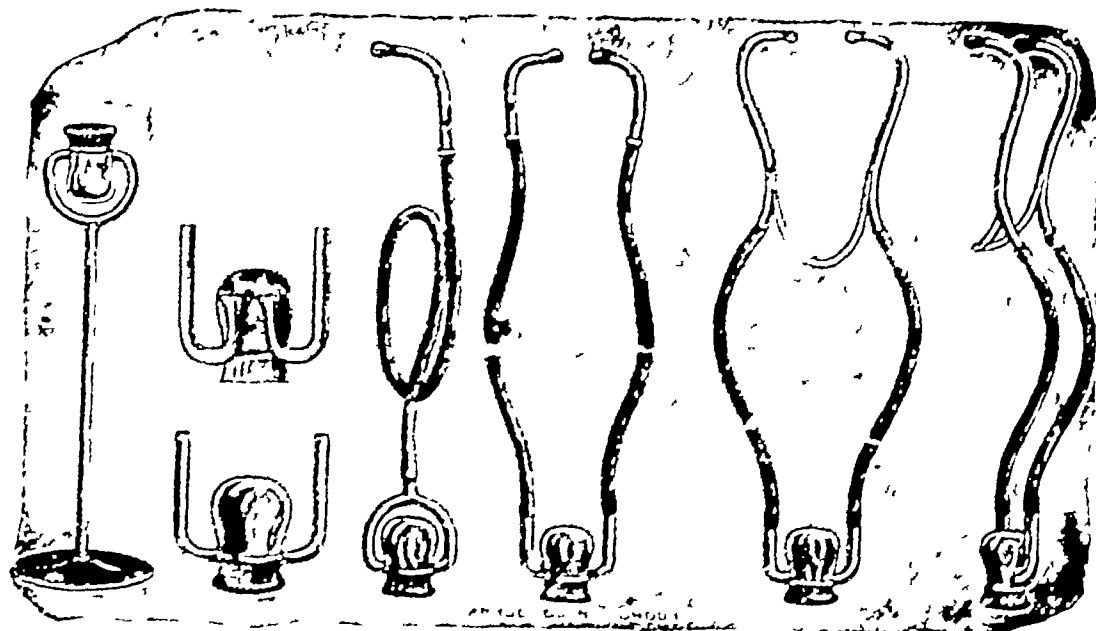


FIG. A FIG. B FIG. C FIG. D FIG. E FIG. F

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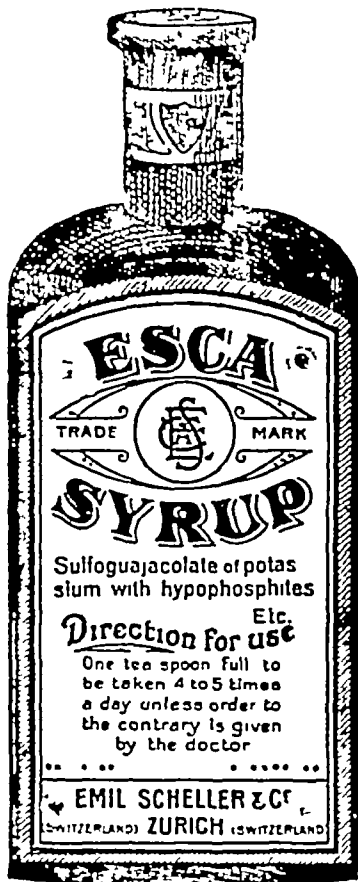
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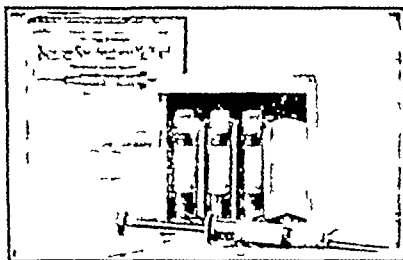
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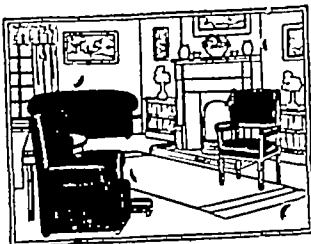
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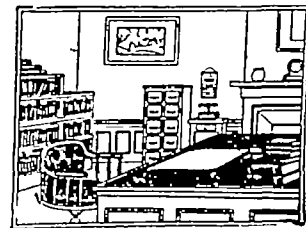
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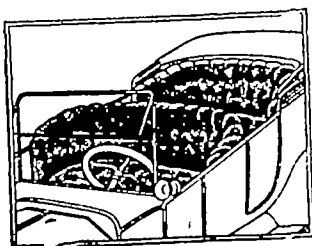
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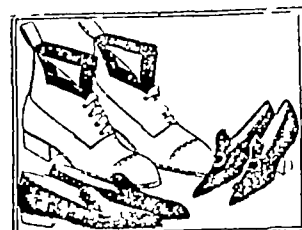
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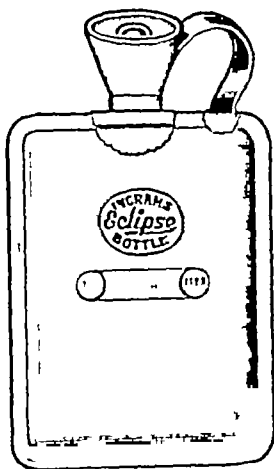
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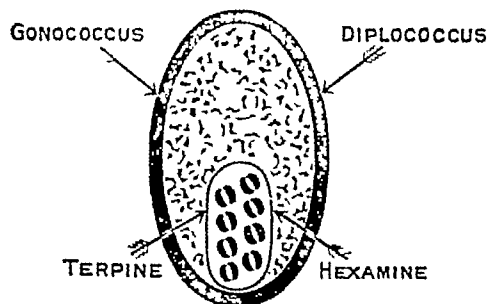
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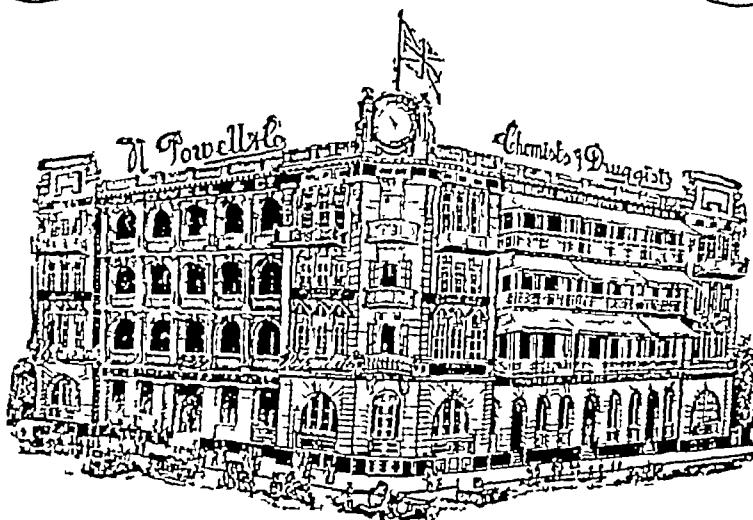
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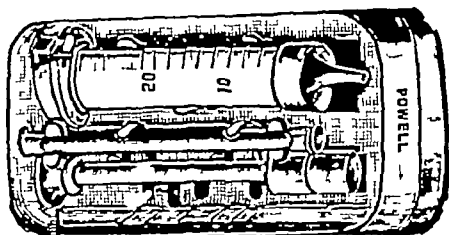
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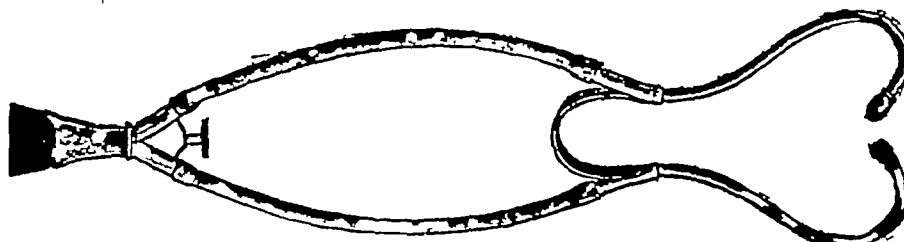
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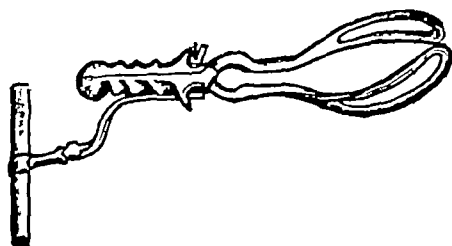
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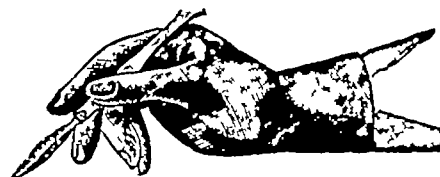
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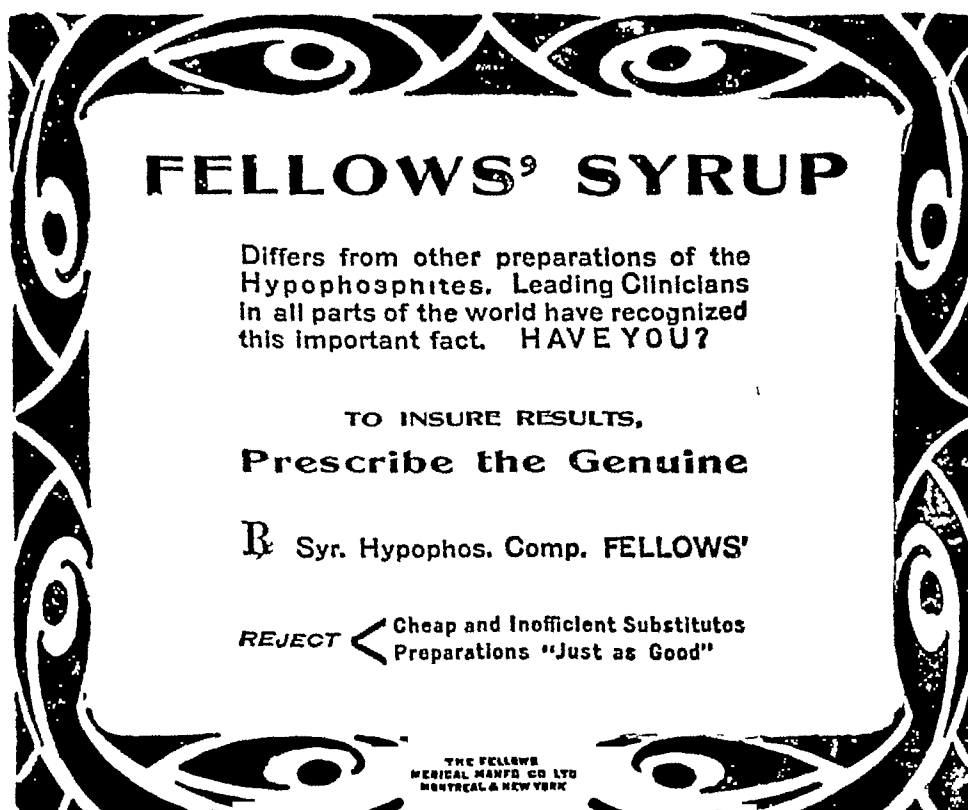
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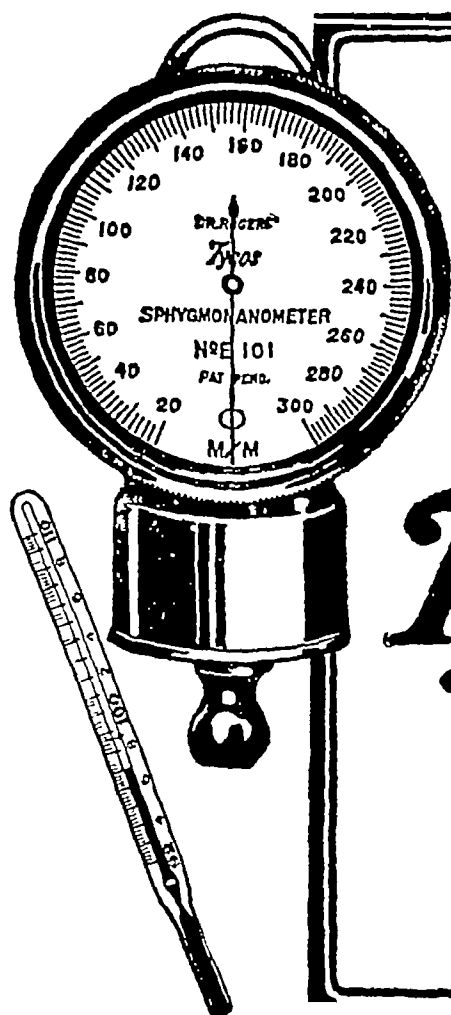
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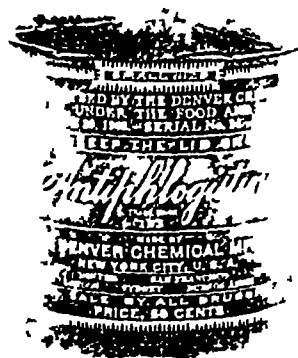
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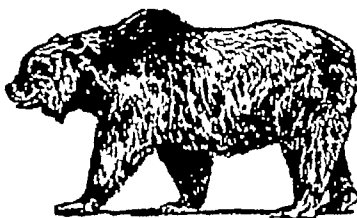


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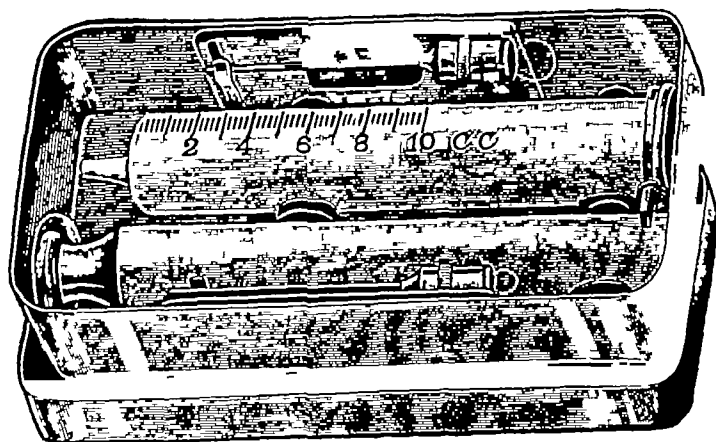
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Original Articles.

A PRELIMINARY PAPER ON OBSERVATIONS ON BLACK WATER FEVER (HÆMOGLOBINURIA) IN THE COORG PROVINCE, 1917-1918, ESPECIALLY AS REGARDS ITS ETIOLOGICAL FACTOR, NAMELY, A PROTOZOAN PARASITE OF THE GENUS PIROPLASMA IN CONJUNCTION WITH THE MALARIAL PLASMODIUM, OR A NEW AND UNDESCRIBED SPECIES OF LAVERANIA MALARIAE (DONOVAN'S THEORY)

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MUT-COL IMS

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(Received for publication, 15th August, 1919)

On the 26th July, 1917, I visited a patient at Santicoppa about 9 miles from Mercara in response to an urgent call by the Sub-Assistant Surgeon (the patient's father), and found that the little patient F, aged 11 years, was suffering from a typical attack of black water fever of a severe type, with the following symptoms—marked jaundice, the skin, mucous membranes (even of tongue and mouth) and conjunctivæ were of a bright golden yellow colour and in places of a bronze hue high fever—103·8 degrees F—enlarged and tender spleen and liver, constant vomiting, chiefly yellow or greenish coloured bile, much tenderness in the loins and pains in the legs. Urine of a dark porter colour was being passed in large quantities, but less than at onset, that previously passed during the night and earlier in the day had been kept, and contained about one-third of a reddish brown grumous deposit whilst the upper clear fluid was of a faintly red tinge. Bowels constipated.

Previous history—Stationed at Frazerpet for nearly six years. This is a frontier town bordering on the Mysore State, in N. E. Coorg, situated at the foot of the Coorg Hills in the Cauvery Valley, the river winds round the eastern border and the surroundings are very marshy. The locality is highly malarious. The splenic index is noted as 90 to 95 per cent in children. This family consisted of five members and two servants. There was a history of no malarial attacks for five years previous to their coming to Frazerpet. But after six months' residence, all five members suffered from malarial attacks and took quinine, but still continued to get attacks of fever, especially during the malarial seasons, and the three children developed enlarged spleens. After two years' residence, a female servant, aged 15 years, was attacked with severe fever preceded by rigor, and anti-febrin was given at night. On the following morning, she was noted to be markedly jaundiced and in a comatose condition and the clothes saturated with a blood-like fluid (black

water?) There was no menstrual discharge or other vaginal bleeding. The periods had not commenced. This case proved fatal within a few hours. I think this may have been a case of black water fever (hæmoglobinuria). Six months thereafter the Sub-Assistant Surgeon's daughter then aged 8 years, was attacked, she had a rigor and high fever and passed large quantities of portwine-coloured urine, marked jaundice was noted, indeed the case was taken to be one of acute hepatic congestion. Vomiting was a marked symptom with early delirium. Under treatment the urine became clearer after three hours and quite clear after nine hours. The following day, there was a slight return of fever, which is said to have yielded to quinine, the jaundice very quickly subsided and the patient recovered (a mild attack of black water fever). No further attacks of fever for three years, but after about three months' residence in Santicoppa (a small village, 2,500 feet above sea level, marshy, and rice fields in valleys, thickly wooded hills), the girl was attacked with fever on 23rd July, 1917—typical ague. On the 25th July, after the midday meal, she passed black urine and soon after had a severe rigor, with high fever. She complained of great weakness, pains in loins and legs and continued to pass large quantities of black urine, vomiting soon set in with delirium and frequent micturition every three or four hours. At midnight the temperature rose to 105 degrees F with great delirium, bowels constipated. The following morning, she was noted to be markedly jaundiced. I visited the case on the afternoon of the 26th as recorded at the commencement of this paper. The symptoms continued, temperature varying from 103 degrees F to 105 degrees F. There were two attacks of collapse when temperature was 99 degrees F. In the latter attack death occurred suddenly (syncope and coma). The treatment had included Hearsey's mixture and sterile normal saline. The urine was very characteristic. Microscopically it showed granular, fatty and hyaline casts, and a brownish amorphous deposit. No red cells were noted. The peripheral blood was very watery, difficult to obtain and of a yellowish sanious colour. The parasites shown in the diagrams were seen. This girl slept in a room with fowls or near them, and was bitten severely by fowl fleas (*Echidnophaga gallinorum*), and before the daughter was attacked at Frazerpet, their cattle suffered from an unknown disease, fever and great debility, especially paresis of the hind limbs.

Brief notes of 2nd Case—Thelappa, aged 25, a West Coast native (Malayali), working as an estate cooly (rubber and tea) on Hudikeri Estate, about 9 miles from Gonicoppal. This village is very low-lying and skirted by a fair-sized river on the south and western borders of the tea estate and surrounded in places by marshy lands, the locality is notably malarious. He was admitted into the Gonicoppal Local Fund

Hospital, on 13th January, 1918, with a temperature of 102 degrees F. Cerebral malaria was suspected and 10 grains of quinine were injected intra-muscularly. He was comatose, had had bilious vomiting, and was markedly jaundiced. The urine was nearly black. On puncture of finger, watery light-colour blood was obtained with difficulty. Spleen was noted to be enlarged, soft and apparently tender. It extended about 3 inches below the costal arch. The liver was not markedly enlarged. On 1st April the patient was worse generally. The general jaundice was more marked on sclerotics, lips, mouth and nails and body generally. The amount of urine passed was greatly decreased but of the same dark-brown colour, s g 1020, reaction neutral, albumin present, bile nil by Hay's sulphur test and nitric acid. The patient died suddenly on the 15th, never having regained consciousness. No necropsy was permitted. The Sub-Assistant Surgeon, C B Medappa, who is my bacteriological assistant at Mercara and had temporarily been posted at Gonicoppal, sent me two very good slides of the peripheral blood, which showed the parasites depicted in slides 1 and 2 of Gonicoppal case. The history given by the patient's relatives was that he had frequently suffered from fever (nature unknown) at his native place, that he came to Coorg about 14 days previously but never had an attack like the present one, that cattle sheds were in close proximity to the cooly lines on the estate, and that he had often been bitten by leeches, mosquitoes and ticks. This, I think, was a typical case of black water fever.

4th Case—Child, female, aged 3 years, attacked with fever on 1st November, 1918. The attack began with a rigor and continued until evening of 2nd, when it subsided with much perspiration, constant bilious vomiting occurred during the attack. On the 3rd $7\frac{1}{2}$ grains of quinine was given in divided doses (4 powders), on the 4th at the same time (6 P.M.) she had fever, which subsided on the evening of 5th. On the 6th the child passed dark-coloured urine. On the 7th the case came under the observation of the Sub-Assistant Surgeon, Sidapur (South Coorg). Urine passed was of a portwine colour, s g 1016, albuminous, and passed in small quantities. No fever on 8th and 9th, but recurrence on the 10th, temperature 100.4 degrees, pulse 140. Urine light-red, still albuminous but passed in larger quantities. From this date onwards, the urine improved in colour, the fever subsided, and by the 15th November the child was convalescent (probably a case of malarial hæmoglobinuria), slides sent me of this case, improperly taken, only showed a few malarial rings, increased platelets and large lymphocytes.

5th Case—Motor agent, had a severe rigor, temperature 104 degrees F, with enlarged and tender liver and spleen. Jaundice and passage of black urine, coma. The specimens of

peripheral blood sent me showed only indications of a recent malarial infection. Urine s g 1010, reaction faintly acid, colour dark portwine, albumin present in large quantity. When boiled with liquor potassæ, it is said to have given a red precipitate. Temperature was normal on 25th and 26th, and the urine began to clear but still contained some albumin. The history obtainable was that he had suffered from fever for a fortnight in the early part of January. At this time he had an abscess in one leg. He was attacked again on 23rd January, 1918, with fever preceded by a severe rigor and passed dark-coloured urine. On the 30th he had another ague-like attack. Liver and spleen were found to be enlarged and tender and much pain was complained of in the loins and legs. He passed dark-coloured albuminous urine, and was slightly jaundiced. On the 1st February, 1918, evening, had a recurrence of fever, temperature 104 degrees F with coma, and was removed by his relatives to his house in a dying condition. This evidently was a case of hæmoglobinuric fever. Of what kind?

6th Case—Child, aged 12 years, with a history of malarial attacks, had a severe attack of fever in which he was noted to have passed very dark-coloured urine, but recovered under quinine treatment. The cause was not diagnosed, but attributed to severe malaria. The patient recovered but remained for a long time weak and anæmic.

7th and 8th—These cases were reported from Napoklu, a village in S W Coorg. They were boys, aged 7 and 11, who passed dark-coloured urine during fever said to be of malarial type. Both had enlarged spleens and the liver was enlarged in second case with slight jaundice. No blood specimens, etc., were sent to me.

At the time when the first case occurred at Santicoppa, July, 1917, the headman of that village stated that he knew of a Brahmin boy who had died from a similar disease a few months previously, namely, high fever with dark-coloured urine. He said that such cases had occurred in the valleys near Santicoppa, that there was no cure for the disease, which was known as "devil's stroke," "devil's disease," and that all attacked died. This information was given quite spontaneously, and we have a vague history of a patient (from Gonicoppal) being admitted into the Civil Hospital, Mercara, in 1909, with symptoms of hæmoglobinuric fever which ended fatally. This case was diagnosed as dengue. It will thus be seen that black water fever is not altogether unknown in the Coorg Province.

A brief review of the latest theories as to the etiology of hæmoglobinuria—

The passage of more or less altered hæmoglobin in the urine has been divided etiologically into the toxic and paroxysmal. Hæmoglobinuria of malarial origin has been classed under the second head.

SLIDE I

PAGE 1

1, 3 41 53—Horse shoe shaped parasites 1, free 3 in very small erythrocyte 41, in a poikilocyte 2, 17, 18, 26, 31 32 52, 63, 64 65 71, 79 87—Oval shape, with central chromatin or subcentral or eccentrically placed 2, misshapen red cell with two small parasites below red cell with single parasite 17, pear shape 26, one parasite central chromatin, one parasite double 71, two parasites central chromatin 79, two parasites central chromatin and one ring, the red cell is breaking up and the ring parasite is almost extruded 4, a peculiar large parasite showing single central chromatin and vacuole 5, 31, 35, 42, 46, 47, 49, 52 56, 59, 63, 67, 72, 79—Ring forms 34 and 49, thick and heavy chromatin peripheral 63 peculiar chromatin peripheral bar also 66, 67, one ring and one bottle shape 72 ring form 79, one ring almost outside red cell 6, 7, 11, 29, 33 36, 38, 70, 63, 84 86—Long amoeboid processes stretching nearly across the red cell 33 very fine cytoplasmic process also 36, the latter resembling bacillary form of *Piroplasma* (*Theileria*) *Parva* found in blood of cattle (Christophers) in Madras 38, oval shape with fine extension 63 resembles 33 84, extra corpuscular 86 intra corpuscular coccoid bodies

SLIDE II

3, 9 10, 12 14 15, 16, 52, 58, 67, 75, 81, 83—Phial or bottle shape much resembling those observed in 1st case of B W F, North Coorg 12, three bottle shape parasites in red cell, also 15 16, two phial shape parasites in a large mononuclear leucocyte 52, in misshapen red cell 58 in poikilocyte 67, one swollen, one typical 75, one bottle shape small and one large pear shape with two chromatin dots 88, single erythrocyte showing polychromasia. 13, very small ring and oval parasite, three chromatin dots 14, one phial shape and one elongated parasite 17, 18, 26, 31 32, 55, 60, 64, 65, 71 73, 79, 87—single central or eccentrically placed chromatin 19, 21, 27, 39, 40, 43 Dividing parasites, sporulating malaria. 22, 22, 44, 45, 61, 73 71 75—Oval or pear shape with two chromatin masses 83 with free chromatin 25, elongated parasite with two chromatin masses much resembling *Piroplasma* (*Babesia*) *Canis* (Christophers) 48, coccoid parasites with joined chromatin, 50 coccoid parasite in distorted red cell, Polychromasia 51, two parasites central chromatin 77, polychromatic red cell, also 69, 76 and 77 and 89, 82, 78 parasites being extended from red cell which is breaking up 85, chromatin masses in large mononuclea Many of the red cells are peculiarly distorted

V=Vacuole P=Pigment.

E H W

Nos. 1, 4, 10, 19, 24, 38, 40—Piroplasma forms

2, 7, 20, 32, 49, 51, 62, 73, 74, 93—Oval parasites, two chromatin dots, one, the larger, situated at the blunt end

3, 9 (very small ring and bacillary form), 13, 16, 34, 37 (one ring and bacillary form), 45 (with central chromatin), 54 (same as 45), 64, 70 (one bottle shape, one ring, two chromatin dots), 79 (broad bar chromatin) 83, 85, 92, one triangular and one central chromatin parasite, 99 (a very minute ring), 100, a small piroplasma form central chromatin, 103, a peculiar double parasite

Ring forms

5, 8 14 (triangular parasites either lying on or being extruded from erythrocyte), 18, 23 44, 48 (one horse shoe shape, one coccoid body), 50, 52, 64, 65, 72 (one horse shoe shape, one coccoid), 87 (one triangular, one peculiar bacillary or coccoid parasite), 92 (one triangular, one central chromatin ring)

Horse shoe and triangular shaped parasite forms 6 probably one horse shoe, overlapping a bacillary form 7, 20 49, 51, 73, 93 (characteristic oval forms with two marked chromatin dots, the larger situated at the blunter end) This form is seen in all the pages of diagrams, closely resembles those observed in case I, Suniticoppa, North Coorg, as also those forms noted by Colonel Donovan in the case of B. W. F. from "Gumsur Malliabs" 11, a peculiar form, probably ring and bacillary form

41, 12, 78, 86, 95 and 101, probably degenerating erythrocyte, or anaplasma form, 15, 17, 22, 25, 31 (one ring, one bacillary form), 39, 42, 46, 47, 48, 53, 55, 57, 67, 69, 71, 72, 76, 77, 81, 81, 82, 84, 87, 89, 90, 98, 102, bacillary or coccoid forms, resembling forms of Theileria, 27, large mononuclear with chromatin particles probably phagocytosis, 29 peculiar form, 28, 33, 59 (two phial or bottle shape parasites side by side, 68 the same), 70, 97, phial or bottle shape

BLACK WATER FEVER

Col Hasell Wright, I M S very kindly sent me two slides of black water fever under his observation in Coorg. No 1 slide I found impossible to restrain satisfactorily, notwithstanding orange-tannin monosodium phosphate and boric solutions, so I cannot express an opinion on the parasites in that slide. No 2 slide, however, retained fairly well and I was able to detect the parasites resembling piroplasma. The parasite in No 2 slide is a very small *Laverania*, the chromatin much smaller than in *L. malarie*. In some R. B. O. the organisms simulate piroplasma closely, as can be noted in the figures I have given in the plate I have taken but there is no doubt that the full grown forms and the sporulating bodies contain well marked pigment, thus excluding the presence of piroplasma or the organism as giving rise to black water. Unfortunately my knowledge of black water has been after the R. B. O. infected has been destroyed. In one case from Gumsur Mallahs, Ganjam District, I noted forms like Col Hasell Wright's. I hope Col Hasell Wright will carry out further work on these peculiar and what I consider an undescribed species of *Laverania*. I believe in several species of *Laverania* (not including the genus *Plasmodium* with the species *malarie* and *vivax*).

C DONOVAN

Experimentally, by intravenous injections in animals hæmoglobinuria can be caused by dissolved hæmoglobin or by substances that will dissolve the red corpuscles, as water glycerine, salts of the bile acids inhalations of ether, sulphurated hydrogen, etc.

In man toxic hæmoglobinuria may be caused by poisons such as sulphuric acid, hydrochloric acid arsenic chlorate of potassium, naphthol, etc. Also it may be caused by extensive burns sunstroke and is symptomatic in specific diseases (scarlatina enteric, etc.) It occurs in icterus of the new born and may be caused by dissolution of the blood in purpura, scurvy, typhus, variola hæmorrhagica, etc.

Intermittent or paroxysmal hæmoglobinuria is a special specific disease almost identical with black water fever (tropical hæmoglobinuria) in onset symptoms and pathology, in fact if a case of the former occurred in the endemic regions of black water fever it certainly would be diagnosed as the latter disease. By some authorities black water fever is described as paroxysmal hæmoglobinuria of malarial origin. This disease (P H) is said to be due to syphilis (*S. pallida*) and the immediate provocative cause is attributed to cold either severe chilling of the skin generally, or mere exposure of hands and face to cold or damp winds or wetting of the feet in cold water. Experimentally hæmoglobinuria has been produced in a patient by dipping the feet in ice cold water (Nelson and Ferry, *Arch. of Int. Med.*, June 1910). Ehrlich showed that by placing a ligature around the finger of a patient and exposing it to cold, the blood corpuscles were broken up and the hæmoglobin dissolved in the serum. It may also be caused in such patients by over-exertion and mental excitement. Cooke writes—As result of chemical observation, the Wassermann reaction, the luetin test and serological studies in metasymphilitic disease it seems safe to say that "Syphilis is the most important, possibly the only etiological factor in paroxysmal hæmoglobinuria" (*Am. Jour. Med. Sci.*, August 1912). W. W. Young (*Jour. Am. Med. Assoc.*, January 31 1914) writes—Case of P H, in the blood serum of which, either constantly or brought into existence by cold, there exists a substance which hemolizes the red blood cells this gives rise to hæmoglobinemia, which in turn provokes the phenomena of a paroxysm much like that provoked by the destruction of hematin by the action of the malarial parasite. The excretion of the hæmoglobin in the urine by the kidneys is one of the most striking phenomena and gives the disease its name. This auto-hemolytic substance in the blood is in all probability the result of infection by the *Spirochaeta pallida*, on the other hand the possibility exists that the substance which is produced by the organism in syphilis and to which the name of anti-body is given (which produces fixation of complement, thus giving a positive Wassermann) is produced by some other

agency in this disease. Thus there may exist a positive Wassermann without syphilis. The existence of this same substance which gives rise to hæmolysis in para-symphilitics so-called makes it highly probable that the etiological factor here too is syphilis. It is quite possible that hæmolysis may take place in the menstruum of the para-symphilitic and that it is an increased permeability in the hæmoglobinuric which gives rise to actual hæmoglobinuria. The cause of black water fever has by some been attributed to syphilis, alcoholism, poisons, etc., and the attack is precipitated by cold, over-exertion, physical and mental or in those greatly run down in general health.

The pathology of the two diseases (P H and B W F) under comparison differs only as to the parasite or parasites which produce the powerful hæmolytic toxin producing the hæmoglobinuria-urine, whose colour varies from a delicate rose colour to a reddish or brownish black or deep black and has been likened to the colour of portwine, coffee or porter, it is of variable sp. gravity and highly albuminous depositing after a time a chocolate-coloured grumous substance which under the microscope is seen to consist of granular hæmoglobin-renal casts occasionally, a few (very few) red cells distorted and breaking down also a few crystals of uric acid, and oxalate of lime. The colouring matter is most frequently meta-hæmoglobin. Bile pigments are seldom present, the albumin present is in the form of serum albumin, serum globulin and nucleo-albumin. The reaction is generally faintly alkaline. Phosphates are reduced. Yorke (*Annals of Trop. Med. and Parasitology*, December 30 1911) believes that the epithelium of the convoluted tubules of the kidney is responsible for the excretion of the hæmoglobin and possibly also that of the tubules of Henle, for in sections of kidneys removed within a few hours of the intravenous injection of hæmoglobin, the casts are found limited to the cortex and are not seen in the larger collecting tubes of Bellini. Later, the plugs are found in the large collecting tubes, having been probably washed down from higher portions of the tubules. Probably hæmoglobin is excreted by the renal epithelium rather than filtered through the glomeruli, and that the amount eliminated is dependent on the activity of the epithelium lining the tubules. The lesions that appear in the kidney are purely degenerative and not inflammatory.

Blood—The pathology is very similar in both types of the disease. The peripheral blood is noted to be thin, watery and pale red in colour, often of an oily nature and obtained with some difficulty. Recent investigations tend to demonstrate the presence of a potential hæmolytic toxin (hæmolysin) composed of an amboceptor and complement. The complement is a normal constituent of blood serum whilst the amboceptor is the specific hæmolysin. The combined

action of this dual toxin on the red cells is dependent upon certain conditions, one of which is a variation of the temperature of the blood. Exposure to cold favours the union of the amboceptor to the red cells, these when carried to the internal parts of the body, where the temperature of the blood is higher, are acted upon by the complement and hæmolysis takes place, first producing hæmoglobinemia and then hæmoglobinuria. It is essential that the blood be first chilled and then subsequently warmed to produce hæmolysis. During the attack the number of the blood corpuscles is diminished, but afterwards many small red cells and hæmatoblasts appear, and the number of the red corpuscles rapidly becomes normal. It has been shown that the blood serum of patients suffering from P H contains during the attack a substance which unites with the red blood cells at low temperatures and on subsequent heating at 37 degrees C in contact with normal serum causes their hæmolysis. Widal and Rostaine have offered an explanation of the phenomenon. They think that the normal serum contains an anti-hæmolysin, which in cases of P H is diminished in amount, and therefore allows auto- or iso- hæmolysis to take place. The writers conclude that their original supposition was correct since three of five of their cases of P H gave a history of syphilis, the authors suggest that this toxic autolytic substance may in some way be produced by a syphilitic infection—Donath and Landsteiner (*C B Bakt u Parasit*, 1907-45-255). In P H the leucocytes are usually about normal, the alkalinity decreases slightly, red cells decidedly, but their number rapidly increases to normal or above it from three to six days after the attack. In B W F during the attack there is leucocytosis (polymorphonuclear and large mononuclear) and after the attack a leukopenia with mononuclear increase. By some observers Raynaud's disease is considered to be closely related to P H and in some cases the two diseases are combined. The former is more commonly seen in women, and the latter in men. The tropical hæmoglobinurias have been divided into three distinct types.

1 *Malarial*—A hæmoglobinuria occurring during the course of pernicious malaria and caused by *Laverania malarie* together with some other factor which *inhibits* the production of anti-hæmolysins. Blasi, Bren and Zieler have shown that the malarial parasites give rise to a hæmolysin which probably varies in quantity and quality with different strains of parasites, but is kept in check by the action of anti-hæmolysin which is formed in the body, but in certain circumstances, such as exposure to cold, etc., may fail to be produced in sufficient quantities and hæmoglobinemia with hæmoglobinuria may occur. Zieler and Brom have also demonstrated the presence of anti-hæmolysin in the serum of normal individuals as well as in that of persons suffering from pernicious malaria. It would, therefore, appear as

though the presence or absence of hæmoglobinuria in an attack of pernicious malaria depends upon the relationship between the quantity of hæmolysin produced and the amount of anti-hæmolysin produced. The symptoms of this variety are those of an attack of pernicious malaria in which the main feature is that of hæmoglobinuria, the presence of *Laverania malarie* in the blood, and the rarity of jaundice of a marked nature as is seen in the specific disease (B W F).

2nd Type—*Quinine hæmoglobinuria*, caused by the administration of any of the ordinary salts of quinine in certain cases of chronic malaria or malarial cachexia. Sir Patrick Manson has pointed out that "the idea that quinine might produce B W F originated from a misinterpretation of the fact that the administration of quinine even in small doses may provoke the manifestation of black water fever in a patient in whom the infection is latent." Again, he states that B W F was known long before cinchona bark was introduced into Europe, having been described in the days of Hippocrates, and that cases have been reported amongst Europeans who had never taken quinine. Cadamatis mentions 32 such cases. On the other hand Ketchen has recorded a case of seven consecutive attacks in the same individual in whom each attack followed a dose of quinine, and Castellani and Chalmers have recorded similar cases of hæmoglobinuria due to quinine, and record six attacks in a year. These authorities say that the administration of the quinine salts in such cases is not the sole cause, otherwise the condition would be more commonly met with than at present. Therefore, it is quite safe to give quinine to the majority of cases of chronic malaria without fear of causing hæmoglobinuria, for the administration of a salt of calcium prior to the quinine will prevent the hæmoglobinuria which may have occurred after quinine previously given. Barralt and Yorke have demonstrated the action of quinine bi-hydrochloride, also hydrochloric acid and sodium hydrate upon healthy red blood cells.

(1) All the above-mentioned agents produced hæmolysis. (2) In equimolecular concentration their hæmolytic power is almost the same. (3) The hæmolysis produced by quinine resembled a catalytic action and took place at a monomolecular rate. (4) During life it is not possible to reach a percentage of quinine in the blood sufficient to cause hæmolysis owing to the toxicity of the drug. Some observers believe that quinine produces the hæmolysis by lowering the osmotic pressure of the blood plasma. The symptoms of this type are those of an attack of black water fever, but of a milder nature, and jaundice is absent.

3rd Type *Black water fever*—A specific disease. This disease was not described before 1885 in India, and Manson explains that probably this was due to its recent introduction into India, which is supported by the fact that many

medical men in Africa assert that B W F is of comparatively recent introduction there, and is becoming yearly more common. This applies also to India and other tropical and sub-tropical regions. Meek says B W F first appeared in Texas in 1886 or the disease was formerly confounded with bilious remittent fever.

The malarial theory—The older writers attributed this disease to a severe manifestation of pernicious malaria. Then it was attributed to the sub-tertian parasite and recently the *P. vivax* and *P. malariae* have been noted in some of the cases. The theory was based on the fact that B W F only occurred in localities where severe malaria also existed and that those who had an attack of B W F had always previously suffered from malaria and had generally had frequent attacks. Stephens and Christophers state that the blood of persons examined on the day preceding the hæmoglobinuria contained malarial parasites in 95.6 per cent, during the day of attack 61.9 per cent and the day after the attack only 17.1 per cent. They further point out that though they only found malarial parasites in 12.5 per cent of all their cases still they found evidence of malarial infection such as pigmented leucocytes or an increase in the percentage of large mononuclears in no less than 93.8 per cent. Against the theory that malaria is *solely* the cause of B W F Manson writes that though in many regions B W F is co-endemic with one or other form of malarial fever, it is not so in all regions. It has its own peculiar distribution and is absent or very rare in many places in which the various intermittent fevers are very rife. Again it has many times been recorded as occurring in persons who have never suffered from malaria, and, according to Craig, it has occurred in people who have not only never been known to suffer from malaria but in whom neither before, during, nor after an attack have parasites been found and post-mortem has revealed negative evidence for malaria. As B W F and malaria are co-endemic, it is not surprising to find malarial parasites in black water fever cases and more often the sub-tertian as that parasite is the more prevalent in the localities where black water fever is endemic. Yet of all intermittent fevers the sub-tertian is that which clinically differs most from black water fever. It is true that sub-tertian varies considerably in different cases, but the *type* of the disease does not alter and the number and distribution of the parasites is always in accordance with the intensity and nature of the various symptoms. In no case of sub-tertian, not even the most pernicious, do we ever find the symptoms peculiar to B W F. On the other hand, all cases of black water fever, however grave or mild, always exhibit the same characteristic symptoms with no difference other than as regards intensity and duration. The existence of the large mononuclear leucocytosis present in B W F does

not conclusively point to its malarial origin, for a similar form of leucocytosis occurs in several forms of protozoal disease. Nowadays there are very few adherents to the theory that malaria *alone* is the causative factor in B W F. Donovan, if I understand correctly, believes in several species of *Laverania*, or postulates a special undescribed variety of *Laverania* with the known forms, as the cause of black water fever. If it be admitted that there is a malarial variety of hæmoglobinuria, and that the malarial parasites (especially the sub-tertian) do produce a hæmolytic toxin (hæmolysin) which in certain circumstances is not kept in check by the anti-hæmolysin which is formed in the body, as shown by Blasi, Bren and Zeiler, the theory becomes an attractive one—especially if it be argued that the new species of *Laverania* has a more powerful hæmolytic property. If this special *Laverania* is combined with one or other of the known varieties of *Laverania*, their combined hæmolysins may be responsible for the explosion of the symptoms of black water fever. Or the presence of the new species with powerful hæmolytic properties and fresh infection with *Plasmodium vivax* or *P. malariae*, which are more frequently seen in India, may be sufficient to determine an attack. Or the supervention of a second disease or debility caused by dysentery, over-exertion, exposure to cold, etc., in those whose blood contains this special species of *Laverania*, may cause an attack of the disease. Cook has placed on record five causes of black water fever in which an attack of spirillum fever appeared to be the provocative agent. The parasites in my first two cases are very similar to Donovan's B W F forms and the pigmented forms in case 2 indicate a malarial infection. Could therefore the proplasma forms and the unpigmented forms be a new species of the malarial plasmodium (*Laverania*), in conjunction with one or other of the known forms (*L. praecox*, *L. immaculata*), or even the *P. vivax* or *P. malariae* (pigmented forms) be the cause of black water fever in at least case No 2? Or is the new and peculiar species one of the known species that has acquired a peculiar contour resembling the piroplasms and a powerful hæmolytic toxin by passage through some unknown mammalian or insect host? Having noted a malarial plasmodium whilst dissecting a land leech (*Haemadipsa zeylanica*), in whose gut the parasite appeared to me to be developing, I started an experiment by feeding leeches on cases of malaria also ticks (*Hyalomma aegypticum* and *Margaropus annulatus*) with a view to ascertaining if any development did take place, but my investigations were stopped by the advent of the great pandemic wave of influenza, and I could not arrive at any definite conclusions in this respect. Stephens recently has supported the malaria *plus* some other factor theory—the second factor being quinine. According to him, B W F is not a disease *per*

se, but rather a condition of the blood in which quinine, other drugs, cold or even exertion may produce a sudden destruction of red cells. The condition is produced only by malaria and generally by repeated slight attacks insufficiently combated by quinine. In such cases of chronic malaria, *ie.*, in those suffering from anæmia with repeated attacks of fever and repeated doses of quinine, B W F sooner or later almost certainly supervenes, at least in tropical climates. On Stephens' theory Castellani and Chalmers observe "These statements, if genuine B W F is meant, are too sweeping, otherwise the home of the disease would be Ceylon, where it is so rare that we have never heard of a genuine non-imported case for in this island there are Europeans and natives with just the conditions required by Stephens and yet they do not develop B W F, because the only two cases which we have met with or heard of in Ceylon in ten years were most probably cases of quinine hæmoglobinuria. On the other hand Stephens' remarks are correct if applied to quinine hæmoglobinuria." According to McCay, the action of quinine in causing hæmoglobinuria is explained by the sulphates causing a decrease in the total inorganic salts of the plasma, which he thinks implies a decrease in its osmotic tension, water therefore passes into the red cells, causing them to swell up, and, if the decrease in osmotic tension of the plasma is sufficient, they burst. He considers that the causation of B W F is three-fold—(1) Injury to the stroma of the red cell by the malarial parasite. (2) The action of the malarial hæmolysin. (3) The administration of sulphates. He thinks that though the first and second causes may bring about the disease, still quinine sulphate or any other sulphate by its action on the plasma is the exciting cause. On the other hand he finds that chlorides cause an increase of the resisting power of the erythrocytes to hæmolysis. Quinine hydrochloride, especially when combined with sodium chloride and dilute hydrochloric acid, causes usually a marked rise in the resistance. Therefore he considers that it is not the quinine but the sulphuric acid in the form of quinine sulphate which produces the hæmolytic action. In addition to sulphates, McCay found that alkaline carbonates, compounds of alkalis with vegetable acids and also potassium salts diminish the inorganic molecules of the plasma, thus tending to help hæmolysis. Castellani and Chalmers, however, state that they have seen hæmoglobinuria follow the administration of euquinine—the hydrochloride and the tannate. In 1893, Sir Patrick Manson promulgated the theory, that on account of its peculiar symptoms and geographical distribution he considered black water fever to be a disease *suu generis*. In 1898, Sambon, on account of its resemblance to the hæmoglobinuric fevers in animals, brought forward the theory that human black water fever would probably be found to

be a babesiasis. This view has been adopted by Blanchard and others. A body resembling a *babesia* has been described by Forau, but has been criticized by Stephens as resembling the fragmentation and flagellation of erythrocytes, commonly seen in malarial anæmia in the tropics. The analogies between the hæmoglobinuric fever of man and the hæmoglobinuric fevers of cattle are most striking, but as yet no *babesia* has been found in cases of black water fever. Manson suggests that (1) the amœboid forms of the parasite may have been mistaken for the early forms of the sub-tertian parasite, or (2) the parasite has escaped observation on account of diminutive size or anatomical habitat, or (3) it is not usually found in the peripheral blood. Leishman has recently described certain minute bodies in large mononuclear cells of endothelial origin in the blood of a number of cases of black water fever. He also describes peculiar cells which he calls "Chrome cells," in the blood of such cases, and considers that these bodies which are either structureless homogeneous, circular or ring forms, may possibly be Chlamydozoa.

Balfour suggests that the disease is not of parasitic origin but due to the injection of some powerful hæmolysin introduced by the bite of some unknown insect or arachnid. Castellani and Chalmers consider that the cause of the disease is some as yet unknown protozoal parasite.

Ever since Manson promulgated the theory that B W F was a special specific disease in 1893 and Sambon suggested, because of its striking analogy to the hæmoglobinuric fevers of cattle, horses, sheep and dogs, that B W F might be a form of babesiasis this view has been adopted by many of the highest authorities. Some have now rejected it but the very close resemblance between the diseases in man and animals is very striking. In locality, type and mortality, the similarity of the symptoms and post-mortem appearances we have powerful arguments in favour of the theory. In the relapsing fevers of the three continents the symptoms are the same and it is only necessary to describe one variety, *eg.*, the European; the difference in the other varieties being easily traced to the different species of the spirochætes which causes them or the insect vector that conveys them. The same remarks apply to the spotted fever of the Rocky Mountains, of which one variety occurs in the valley of the Snake River in Idaho, and is spread by the tick *Dermacentor modestus* and the Montana disease which occurs in the Bitter Root Valley and is spread by the *D. venustus* (*Andersoni*). The former has a mortality of 5 per cent and the latter of about 90 per cent. Ricketts considers that the difference between the two forms of fevers depends on the difference in the species of piroplasm or the tick that conveys it. The history of the discovery of this piroplasm is interesting. In 1899, Maxy

wrote a paper on the disease. In 1902, Gwin and McCallough read papers on the same and Wilson and Chowning were deputed to investigate the disease in the Bitter Root Valley. They concluded that it was due to a *babesia*, parasitic in a squirrel (*Citellus columbianus*) and the wood-chuck (*Marmota flaviventris*), and that it was spread by the tick *D. reticulatus*. In 1903 Anderson investigated the disease, and supported Wilson and Chowning as regards both the parasite and the tick. In 1905, Stiles published his report in which he failed to find evidence of the existence of the parasite in man or squirrel or of the transmission by the tick. In 1906 King found distinct experimental evidence of the transmission of the disease by the tick. Ricketts has proved that the *D. andersoni* spreads the disease a conclusion which he supported by experiments on guinea-pigs and monkeys but the credit of this discovery he stated should be given to McCall and Breckton. In 1908 Ashburn and Craig accepted the transmission by the tick. The etiology of spotted fever (in Sajou's Cyclopadia, Vol. 8, 1917) is given as follows—Caused by a protozoan parasite which is transmitted to man through the bite of the wood tick (*D. andersoni*). To Wilson and Chowning belongs the credit of discovering this parasite, three forms of which have been identified by John F. Anderson. The most common is a single ovoid body, refractile, situated within the red cell usually near its edge and closely resembling the earliest intra-corpuscular parasites of aestivo-autumnal malaria. When the blood upon the freshly prepared slide is warmed, the parasite rapidly projects pseudopodia and may change its position slightly. A second form, somewhat rarer, is larger and larger at one end and showing there a dark granular spot; this form also is ameboid. The third form, arranged in pairs, is pyriform in shape, with the smaller ends approaching each other and in some cases united by a fine thread. The parasite is developed in the female tick and the young ticks, after being hatched, transmit the infection. The female gets her infection by biting one convalescent from spotted fever. Malignant jaundice of dogs is due to *Babesia canis* carried by the tick, *Ixodes ricinus* (ricinus), *Haemophysalis leachi* and similarly Texas fever or red water of cattle is due to the *Babesia bigemina*, carried by the tick *Margaropus annulatus*, etc. Similarly Isutsugamushi disease (Japanese river fever) occurs in river valleys in certain districts in Japan, after flooding of the adjacent land which some weeks subsequently gives rise to the appearance of a red mite (the larval acarus of *Trombidium akamushi*) that bites all those entering these parts and gives rise to the disease. The etiology of this disease, though not actually known, in theory is as follows—(1) Bacterial *A. proteus* (Bal and Takana) associated with staphylococci and streptococci in the lungs,

sputum and urinary sediment. (2) The protozoal theory. Ogata considers that the cause of the disease is a plasmodium which he states he has found in the blood of numerous patients. (3) Chemical theory. Takana believes that the true cause is a toxin contained in the body of the mite and introduced by its bite, but against this latter theory is the fact that Akamushi of other regions do not convey the disease. These three theories have in a similar manner been brought forward to explain the possible etiology of B W F. From a very brief review of the etiological factor in the above mentioned diseases it is seen that numerous theories have, from time to time been brought forward to explain the cause. Later they have been disproved adversely criticized, or the explanation of the earlier observers has been accepted. The discovery of the piroplasm of Rocky Mountain spotted fever is, I think, especially interesting, more especially the resemblance of this parasite to the earlier forms of the plasmodium aestivo-autumnal fever. Earlier in this paper I have discussed the possibility of the parasites of my two cases and of Donovan's black water fever forms as being possibly a new species of *Laverania* which, in conjunction with the known species is a causative factor in B W F (Donovan's theory) or the conjunction of the presence of this new species with *Plasmodium vivax* or *P. malariae*, but it appears to me to be strange that the admitted regularities of contour, development, etc., of the known varieties of the malarial plasmodium should in this new species assume the almost typical form or forms of the *babesia*, and resemble those types of the piroplasms which are the cause of the haemoglobinuric fevers of animals. Moreover, I ascertained that Texas fever was very prevalent amongst cattle in the province during the year 1917-18. I have also been told that Texas fever is very prevalent on the Western Coast (Malabar) in some years. I therefore assumed that possibly the parasite noted in the second case was a species of piroplasm. The diagrams show unmistakable presence of the malarial plasmodium, and I formed the conclusion that the second case was possibly due to an infection by *babesia* along with the malarial plasmodium. It is difficult to judge which was the primary infection for the latency of both species of parasites (piroplasms and malaria) is well known. As regards the former parasites, it has been observed that cattle that have been attacked with Texas fever, and rendered immune, still harbour in their blood, in small numbers, the parasites which in any subsequent intercurrent disease may determine an attack of red water fever. Edington has observed this to occur when cattle from the South African endemic area of Texas fever were inoculated against rinderpest. With reference to the latency of the malarial plasmodium, I had a good example recently. An officer of the Coorg Commission was attacked with a severe

infection of simple tertian fever at the end of January 1919. He underwent a full curative course of quinine, and blood smears at the end of the course were negative. In June, after touring in the interior of the province, he contracted a septic sore throat which ended in a right-sided peritonsillar abscess. During this illness I prescribed a 5-grain dose of quinine daily in consideration of the recent attack, though I was unable to detect any parasites in the peripheral blood. During convalescence the patient developed clinically a typical simple tertian fever. On the first day of this attack I was unable to find any parasites after careful search, but on the second attack the peripheral blood showed a few typical rings and a few larger forms. He was placed on full doses of quinine and made a rapid recovery. The parasites were probably developing in the internal organs. I therefore argued that the peculiar-shaped parasites (piroplasm? or new species of *Laverania*?) were the original infection, whilst the typical pigmented and sporulating malarial infection was the secondary, or more recent, for there were no gametocytes to be seen in the slides. As to the type of the plasmodium seen in case No. 2, at first I was of opinion that it was *P. malariae*, from the regular appearance of the merozoites in the sporulating forms and the absence of enlargement of the red cells and because the sporulating forms of *Laverania* are rarely to be seen in the peripheral circulation. During recent years many different types of the piroplasmidae have been recorded and by some authors placed under sub-genera, as *Theileria*, *Nuttalia*, *Anaplasma*, etc. The discovery of the piroplasm of Rocky Mountain fever, referred to earlier, would in my opinion tend to strengthen my argument that the black water forms seen in my two cases and those of Colonel Donovan may possibly prove to be true piroplasmata, and that the fresh infection with the malarial plasmodium was the determining cause of the explosion of the symptoms of black water fever. Especially interesting is the recent discovery of a new type of piroplasm by Dr J. W. S. Macfie, Pathologist at Accra, in 1916. The infected cow in whose blood the parasites existed died and Dr Macfie observed that in his experience infections of cattle with piroplasms that he had seen in West Africa had been benign. Dr Carlos Franca, the well-known authority on this group of parasites, after examination of Dr Macfie's specimens reported that he identified *Piroplasma bigemina* resembling *T. mutans*, and a third parasite of great scientific interest, having characters intermediate between those of plasmodium and piroplasma and recalling those of the genus *Achromaticus*. In all probability it was to this third parasite that the death of the animal was due. Dr Carlos Franca described the forms of this new parasite as follows —

1 Round forms, with a regular outline and having a round central nucleus.

2 Fusiform or filiform parasites with a rounded central nucleus

3 Triangular forms with a large round nucleus at the summit

4 Red shaped forms very long and thin, occupying the whole diameter of the red corpuscles and having a central nucleus

5 Amœboid forms, with numerous digitations similar to those of plasmodia. Parasites belonging to the piroplasmidae are the cause of serious diseases in many parts of the world, but in West Africa, the two species most commonly found, namely, *Piroplasma (babesia) bigemina* and *Theileria mutans*, appear generally to be benign. The discovery of this new species points to a highly virulent and fatal infection. The West Coast of Africa is well known to be an endemic region of black water fever. The destructive effect of the hæmolysis in black water fever would appear to have an equal effect on the parasites and on the red cells, as is seen from the diminishing number of parasites seen on the second and third day of the disease, and onwards, the small number seen in case 1, blood taken on third or fourth day compared with the large number seen in case 2, taken on the first or second day of the disease.

CONCLUSIONS

(a) That black water fever is probably endemic in the province of Coorg, that it is more prevalent in some years than others, possibly coincident with the prevalence of hæmoglobinuric fevers of animals. That the localities where this disease occurs is in the valleys of rivers, or valleys with marsh lands at the foot of the hills.

(b) That the parasites observed may possibly prove to be a piroplasm in conjunction with the malarial plasmodium, or a special species of *Laverania* in conjunction with the known varieties of the malarial plasmodium or *Laverania*.

(c) That there exists a malarial hæmoglobinuria, and a quinine hæmoglobinuria and a specific hæmoglobinuria (B. W. F.), which may chiefly be differentiated by the presence or degree of jaundice present with other symptoms.

The Coorg Province affords a wide field for the investigation of tropical parasitic diseases, especially the protozoa and entozoa. I have observed the malarial plasmodium of several types and have given the diagrams of the varieties noted this year (1919). In 1917 I observed malarial parasites in a case of quotidian subtertian fever, probably *Laverania praecox*. In the dissection of leeches and ticks, I have observed Trypanosomes and Spirilla, the former probably *T. evansi* of surra, I have observed also *A. spirochaete* in a horse suffering from fever, anaemia and debility and passage of red water, *A. spirillum* in the fowl (*S. Marchouxi*?). Anchylostomiasis is a scourge in the province among the cooly class, and especially the plantation coolies, the admission rate for this disease in the Mercara Jail is nearly 100 per cent.

on first admission into the Jail. All the hospitals show numerous cases of the disease, the dysenteries, amebic bilantidium and bacillary, etc., are very prevalent etc etc.

In conclusion if by this paper I have in any way assisted in the elucidation of the cause of the important disease black water fever my object has been fully attained. I desire to express my thanks to Lieut-Colonel C. Donovan, M.D., Madras for his kind and valuable assistance and especially for the excellent plates of slide 2 of my second case and that of Mrs. C's case (*I. praecox*?).

Abbreviations—

B. W. F.—Black water fever

H.—Hæmoglobinuria

P. H.—Paroxysmal hæmoglobinuria

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EPIDEMIC INFLUENZA IN AND AROUND THE CITY OF CALCUTTA

By SIR KOHIL CHANDRA BOSE, C.I.E.,

Calcutta

SCARCELY had the people of Barabazar time enough to shake off their remorse, and end the penance which according to the queer customs of their community, they had rigidly to observe to propitiate the goddess of small-pox who had visited their homes when another powerful enemy influenza knocked at their doors and soon trespassed into their households and attacked the inmates. It was about the middle of June 1918 that I came across a number of cases in Cross Street, which is not only the centre of the piece-goods trade, but also the harbour of imported epidemic diseases. It is generally from this street that the germs of contagious and infectious diseases are carried in all directions through the city. In the year 1890 when influenza visited Calcutta for the first time, it selected Cross Street to commence its work. Owing to the very prosperous condition of the piece-goods trade on account of the war, dealers from Bombay, which was badly infected, came to Calcutta to settle with their constituents in the most central part of the market. In course of one week, an epidemic fever, in its character and phases resembling the influenza of the West, had visited every nook and corner of the City of Palaces. In several houses all the inmates were simultaneously taken ill, and there was no one left to nurse the sick or to call the doctor. The menial establishment was not spared, and the

inconvenience suffered by the people can be better imagined than described. Business was suspended and shops were closed. The Postal Department had to curtail the number of deliveries of letters, and in many places Calcutta was like a city of the dead. Although the Assessor of Death was not very exorbitant in his demands, still the strength and energy of the citizens were almost exhausted and many of them had been carried to the very threshold of their eternal home. But after some five weeks all troubles were over, the normal standard of the health of the people was established and business was resumed. From the very cheerful aspect of things nobody could anticipate that virulent forms of recrudescence would soon take place and carry off people by hundreds. Early in September the death rate of Calcutta showed a distinct tendency to go upwards and before a fortnight had passed there was a cry for medical help from every part of the city. There was much discussion among medical men regarding the identity of the disease. Some of the leading practitioners preferred to call it "war fever", some called it dengue, whilst the majority declared it to be the influenza which was then prevalent in every part of the world. This time the disease selected for its victims the most useful members of families and did not much affect the menial establishment. The schools had to be closed. The municipality took up the matter in right earnest. Relief centres were opened to distribute medicines, both curative and prophylactic, free to the people, travelling dispensaries were requisitioned, and qualified medical men with their medicine chests travelled about in gharies through the lanes and alleys of the city to distribute medicine to the poor people. The Health Department tried hard to minimise the spread of the disease, and thousands of the people resorted to the district officers to have the prophylactic nasal douche, but all measures failed to prevent dissemination and the dispensaries had to be kept going throughout the year. The fell disease was no respecter of age, sex or nationality, save that it rarely affected sucklings. Climate had no influence upon it, and we had reports of influenza from all quarters, and even the sandy soil of Rajputana was not exempted from its operation. In fact, no country was immune.

With this short preamble I would now commence to deal with the main subject of influenza itself. In giving a short description of the disease I need not repeat what I have already said in my first paper, which I had to read before the Medical Society and which duly appeared in the pages of the *Medical Gazette*. From the ancient literature dealing with the epidemic diseases in India I find no mention of influenza in the Ayurvedic system of medicine which is supposed to be a complete encyclopædia of diseases that affect the human race. It is a pleasure to find that in the *Mushuk Puran* there

is mention of bubonic plague and its spread through the rat population, with hints as to what should be done to avoid infection. In Castellani and Chalmers' book on tropical disease we find it stated that the ancient Hindus knew that mosquitoes were the carriers of a peculiar kind of fever. Undoubtedly there were keen observers amongst our Indian physicians, and it is a matter of regret that with the destruction of the Alexandrian Library we have lost all that they wrote relating to diseases of the country. The Egyptian and Arab physicians did not write anything about influenza, so beyond the description of the disease given in the volumes dealing with the epidemic diseases of Europe we have no authentic record on the subject. Previous to the year 1890 influenza was absent from the list of epidemic diseases of the country. There may have been mild cases of the disease, but no special attention was paid to its study.

The causative factors of influenza—It is probable that Pfeiffer's bacillus is the direct cause of the disease, but it is very difficult to isolate this from the many micro-organisms present in the nasal discharge, indeed it often appears to be absent, because of the presence of pneumococci, staphylococci and streptococci. My own conviction is that influenza is a peculiar kind of septicæmia caused by the toxins generated by the combined action of a group of bacilli amongst which Pfeiffer's bacillus has got its part to play. This accounts for the anomalous phases of the disease. My esteemed friend Dr G C Chatterjee Bahadur of the Pathological Department, who very kindly undertook to study the disease bacteriologically, has supplied me with notes of his experience which, for want of space, I cannot reproduce here. Dr J N Das Gupta has also thrown much light on the subject of the pathology of influenza and has written a paper on the subject. Atmospheric and telluric causes have little part to play in the production of the disease. The epidemic of influenza in 1890 was preceded by a heavy rainfall, but the rainfall of 1917 was normal. It is very difficult to say whether the intensity or virulence of influenza is modified by climatic influences, humidity and dryness of the atmosphere, but there is not the slightest shadow of a doubt that variations in temperature sometimes tell seriously upon the resisting power of the sick.

Period of incubation—It is very difficult to trace with any amount of certainty the exact period of incubation. Hundreds were taken ill within a few hours, whilst others who were real contacts were not affected until six days from the time of their exposure to its influence. The period, then, ranges from a few hours to six days. During the incubative stage some feel out of sorts but many do not feel anything and are quite capable of attending to their business affairs until they have to take to bed.

Although the disease is highly infectious, still instances are known where people who were constantly in touch with the sick escaped. There is no doubt that the disease is transmitted from individual to individual, and the nasal discharges from the sick are the direct causes of its dissemination. These discharges, when half dried up, are easily wafted by the wind, and dust impregnated with the germs of disease easily gets access into the air passages of people, who sooner or later fall victims. I have watched the first epidemic of influenza during the onset of the spring in 1890, I have also studied the phases of the disease during its advent in June and July 1918, during its recrudescence in September, and I think and believe that according to circumstances influenza undergoes change or alteration in its characteristic feature. During the first epidemic of 1890 the mortality was nominal. In the epidemic of June last the number of sick was great but the death rate was comparatively small. During the recrudescence from September till the middle of January the virulence of the disease was most marked, and the death rate was simply appalling. I will in this short paper deal only with the important and anomalous phases of the disease. From the very beginning of the disease the patient complains of heaviness of the head, and may have a peculiar sort of hacking cough with pain over the windpipe. Often there is slight hoarseness of the voice, which in some cases continues for weeks. There may not be any appreciable rise in the temperature, but the patient becomes dull and apathetic, and there is loss of appetite and insomnia. These symptoms last for three days and then gradually disappear, so that after a week the patient recovers his former health and goes about doing his ordinary business. In some cases the headache is intense, and accompanied by shivering, with a high temperature and suffused conjunctiva. There may also be present much aching in the limbs and pain in the joints, but little or no cough may be present. The temperature remains high for a day or two and then goes down, leaving the patient very weak. In many cases cough becomes troublesome and auscultation reveals general bronchitis. The temperature then shows a tendency to go up and pneumonic patches may now be detected. With the appearance of pneumonia the heart muscles become flabby, and gradually the first sound becomes muffled and then in most cases disappears altogether. In some cases expectoration is so free that the spittoon has frequently to be emptied. The temperature falls below normal and the skin is bathed in a cold sweat, while the blood pressure is very much reduced and the pulse becomes soft and in some cases intermittent. If the patient be wise and does not over-exert himself he may have a good chance of recovery, but in the majority of such cases the patient dies of cardiac failure.

Epistaxis—Epistaxis is commonly met with in cases of influenza, but as a rule ceases of itself. I have, however, seen some cases where epistaxis was a formidable complication and required active treatment to stop the hemorrhage.

Deafness—From the very early stage of the disease the majority of patients complain of noises in the head. In most cases catarrh or inflammation of the Eustachian tube is present, and this may cause permanent deafness.

Some cases resemble intermittent fever. The following shows this—A Marwari gentleman, aged 22 had a distinct rigor on the 18th of September 1918, followed by high temperature (104 degrees F). On the following morning the temperature fell to 99 degrees, but towards evening the patient complained of feeling chilly, and the temperature rose to 103 degrees. Towards morning there was marked reduction in the temperature and just as on the previous day came down to 99 degrees. Intramuscular injection of quinine was given but with no effect. The temperature rose again to 103 degrees, but this rise was not preceded by a rigor. Next morning the temperature had fallen to 100 degrees and continued to range between 100 degrees and 103 degrees for a week, when auscultation revealed the presence of pneumonic patches. The symptoms gradually became grave. The patient became cyanosed, with an imperceptible pulse, and skin was bathed in a cold sweat. The patient ultimately died. I have seen several cases of this sort.

Cyanosis—In the present epidemic of influenza cyanosis was often seen and generally was the herald of death. The extensive mischief in the lungs was, of course, the cause of the cyanosis. The heart was embarrassed and its beats muffled. If the lungs could be cleared and their normal functions restored, the cyanosis vanished.

Parotitis—This was often seen, and usually during the decline of disease rather than during its acute stage. *Phlebitis* was another complication, which often brought about a fatal issue.

Polyn neuritis—Polyn neuritis is a grave complication of influenza, and requires the serious consideration of those who are interested in the study of the pathology of the disease. We often come across neuritis in cases of diabetes, enteric, diphtheria and other septicæmic fevers, but it is readily amenable to treatment and does not permanently cripple the patient. The neuritis of influenza, on the other hand, has blighted the prospects of many a promising young man. A patient apparently doing well and anxiously expecting to return to duty is suddenly struck down with hemiplegia or paraplegia. In the epidemic of 1890 cases in which meningitis of a mild or grave form was noticed did occur, but complete paralysis was conspicuous by its absence. During the late epidemic many cases

of polyneuritis came under notice. It was very difficult to detect the approach of neuritis or paralysis from the general appearance of the patients. Insomnia, headache and slight delirium during fever were often observed, but such symptoms were not often followed by neuritis, although in some cases they were the forerunners of insanity.

A man, aged 32, a clerk employed by an Indian mercantile firm, contracted influenza in December 1918, but he had a very mild attack, and his temperature never rose higher than 100 degrees, and on the fourth day the fever subsided and he felt well enough to go to work. In the evening, however, he had a return of the fever, the temperature rose to 103 degrees F and he complained of pain in the chest, his voice became hoarse, and on the following day all symptoms of influenza appeared. Cough was most troublesome, and auscultation revealed the presence of diffused bronchitis. He was somnolent and lay with his eyes half-closed. Influenza vaccine was tried and had an effect upon the temperature, which fell to 100 degrees, but with the fall of temperature his condition did not improve. On the 11th day he showed symptoms of myelitis, there was girdle pain over the muscles of the abdomen, he could not lift up his arms and his legs were stiff. His motor functions were rapidly lost. The reflexes were at first exaggerated and then disappeared. He complained of acute pain in the joints, and general hyperæsthesia of the whole body, but did not altogether lose control over his bladder and rectum. His articulation was not clear. Careful treatment improved his condition very much, but it took a long time before he could stand upon his legs. He is still very shaky. I cannot say whether the toxin of influenza was the direct cause of this neuritis or whether it was due to ultra-microscopic germs which were only brought into play by the advent of influenza.

Chorea—Chorea is another complication which requires special mention. It was observed in young children of both sexes. The involuntary movements came on weeks after apparent recovery from influenza. The symptoms lasted for many months and then gradually passed off. A healthy-looking Marwari boy, aged 15, got influenza along with other members of his family during the early winter of 1919. He was pronounced convalescent after ten or twelve days, and was allowed to return to his school. This was in November 1919. By the middle of December he manifested choreic symptoms which persisted for three months and then gradually disappeared. This boy is all right now, save that he has slight involuntary movements of the muscles of his arms.

Diffuse general bronchitis with profuse expectoration is a bad complication, as it exhausts the vital power of the patient. There may be patches of pneumonia which make the signs like those of capillary bronchitis until the

microscopic examination of the sputum reveals the true nature of the disease. In these cases the pneumococcus predominates over the micrococcus catarrhalis and streptococci. The prostration in the broncho-pneumonia of influenza is grave, and reason often fails to account for it. Incessant coughing produces rigid contraction of the muscles of the abdomen accompanied by tenderness, which requires special treatment for its relief. The rise or sudden fall of temperature is no guide to the practitioner to pronounce his verdict. In the majority of cases perspiration breaks out at the very onset of the pneumonia, and the sub-normal temperature does not necessarily expedite convalescence. Crepitations or râles from apex to base were not necessarily accompanied by high temperature. The peculiarity observed in these cases is that the expectoration was unusually profuse, and I remember one case in which the expectoration measured came to nearly four pints during 24 hours. Still the cough continued to be as troublesome as it was before. The expectoration is at first mucopurulent and thin, it soon becomes purulent and nummular. Occasionally there is expectoration of thick pus.

Hæmoptysis—Hæmoptysis was a common complication of the recent epidemic of influenza. Often the symptom yielded to rest and ordinary treatment, but sometimes it was of an alarming nature, and in a small number of my cases it was the direct cause of collapse and death. Nothing is more distressing to the sick than the appearance of *pleurisy* as a complication of the pneumonia of influenza. The area affected is always extensive. It often includes the diaphragmatic pleura and then causes great suffering. Hiccough becomes constant and worries the patient and is not easily amenable to treatment.

Diarrhoea—Diarrhoea is another formidable complication of influenza which was apt to be confounded with choleraic diarrhoea. The stools were passed involuntarily and in copious quantity, the urine was passed in drops and later ceased to flow. In some cases retching and vomiting occurred, making the picture very like that of cholera, but thirst was not nearly so urgent as it is in that disease. The stools were at first bilious, then serous, and sometimes contained flakes of tissue. The pulse was usually soft and compressible at first and then gradually imperceptible. In the majority of cases the temperature ranged between 99 degrees and 102 degrees F. Ordinary routine treatment and saline injections sometimes raised the temperature as high as 108 degrees, and ice-packing and injections of ice water were employed to bring it down. The general condition of these patients did not improve. In some the lungs became œdematous, the first sound of the heart disappeared, and the patient succumbed.

Heart—From the onset of pneumonia the heart becomes flabby and the pulse becomes soft and compressible. There may or may not be a

bruit. The first sound may be muffled or altogether absent and the patient complains of a sense of discomfort in the precordial region. The temperature alone cannot account for this change in the character of the pulse. The toxin of influenza has a tendency to affect the heart muscle. In most cases there was marked tachycardia. In a few there was bradycardia and cases are not wanting to show that the pulse came down to 32 in a minute.

Arrhythmia cordis—Arrhythmia of the heart is a peculiar trait in the clinical phase of the disease, and its effect upon the general condition of the patients is extremely unsatisfactory. Patients apparently doing well may succumb without any appreciable warning. One of the prominent members of the Marwari community had a smart attack of influenza along with other members of his family in November 1918. He had pneumonia affecting both lungs. He was kept in a very commodious house and every necessary arrangement was made to make him comfortable. His expectoration was copious and the spittoons had to be constantly changed. His temperature ranged between 100 degrees and 102 degrees. He perspired freely, with respiration 60. Under treatment the temperature came down to 98 degrees and respiration rate was reduced to 26, and the insomnia from which he suffered disappeared. But the heart muscle remained flabby and the first sound was still inaudible, and the pulse was irregular. His appetite, however, returned and the craving for food was intense. He was kept upon slops, and not allowed to sit up. One morning he woke up as usual and wanted his friends to bring him some food forthwith. He was cheerful and took interest in the report of his business affairs. A cup of milk was brought to him, but he could not take the cup in his hand. He complained of an unusual sensation over the precordial region, and his condition soon became alarming. Before the doctor could arrive he died. His brother-in-law, who was taken ill at the same time, also died of cardiac failure.

It is very difficult to say whether the present epidemic of influenza spread among the domestic animals. During the outbreak of influenza in 1890 the equine species badly suffered from a peculiar kind of distemper, highly contagious in its character and very fatal, which was generally known by the name of "pink eye." It is not for me to discuss here whether the pink eye of horses and influenza of men are one and the same disease. The bacteriologists alone can throw sufficient light on the subject. But "pink eye" was conspicuous by its absence during the recent epidemic. Dr J N Das Gupta in his admirable paper on the bacteriology of influenza has said that he succeeded in inoculating monkeys and guinea-pigs with the cultures taken from naso-pharyngeal discharges from patients suffering from the

virulent type of influenza. He found that rats are immune against influenza.

Swelling of joints with effusion in influenza

During the recent epidemic I came across a group of cases in which the disease simulated in every phase true rheumatic arthritis. When the effusion was great aspiration was necessary to give relief to the patient. In one case there was distinct accumulation of pus in the knee joint.

Melana—Hæmorrhage from the bowels is extremely rare in influenza, but that is no reason to say that melena is altogether absent during the course of the disease. My esteemed friend Dr. Kartick Chandra Bose very kindly showed me two cases in which death was due to profuse flooding of blood from the bowels.

Phthisis—People whose resisting power was brought to its lowest ebb showed signs of phthisis during the decline of the disease and later the characteristic bacillus was discovered in their sputum. About 10 per cent of cases showed this sequela.

It may not be out of place to mention that the phthisis of influenza is very insidious in its character. In some cases the inflammation subsides readily whilst in other it is apt to run a protracted course either with or without effusion.

Sometimes influenza simulates plague and it often becomes a puzzle for a practitioner to differentiate one from the other at the onset. The sudden rise of temperature with pain over the glands of the neck, red eyes, intense headache with slight delirium absolutely mask the true nature of the illness. This state of things continues for a day or two when the true nature of the disease reveals itself and characteristic features of influenza come into prominence.

Influenza often manifests symptoms of *cerebro-spinal meningitis*, and veteran clinicians often committed blunders in pronouncing their verdict. Besides stiffness of the neck, intense headache and delirium were present. Time alone could clear up the diagnosis, for Kernig's sign was not always present, and lumbar puncture did not throw sufficient light on the subject.

Abortion is very common in influenza and the hæmolytic action of the toxin of influenza favours hæmorrhage in many a case. Instances are not wanting to show that pregnant women can sometimes carry to term, and be delivered of a healthy child, but the majority of pregnant women die of influenza.

Like plague and epidemic dropsy, influenza promotes interstitial hæmorrhage within the structures of the eye. Eye complications are very common in influenza. Hæmorrhagic patches in the retina have made many a man blind. Optic neuritis, glaucoma and iridochoroiditis are the worst forms of eye complication. In his learned paper on "Influenza and the Eye," Dr. J. N. Moitra has graphically

described a few cases in which influenza was the cause of blindness.

It must be admitted that unlike other specific fevers one attack of influenza does not offer protection against another. In fact one attack increases the susceptibility of the patients to subsequent attacks. In some cases vaccine treatment has been followed by very good results, but it is yet premature to say whether these cases were uncomplicated cases of the disease in which one could reasonably expect recovery in three to six days' time. In spite of the uncertain nature of the action of vaccine in the treatment of influenza, the tendency among the practitioners of the progressive class is to push it and to attribute every slight improvement to the use of the vaccine. It is a matter very much to be regretted that there is a morbid tendency amongst the rising generation of medical practitioners to overdo a thing. It is not for me to criticise their action, nor do I pretend to cure influenza by medicine simply. I simply say that there is no hard and fast rule for the management of influenza cases and each case ought to be treated on its merits.

As a member of the old school I would naturally myself refrain from doing things in a haphazard way. But that is no reason why I should pass for a man much behind the times. I simply urge the necessity of doing things in a scientific way and not to put much reliance upon the conjecture or surmise of the progressive practitioner of the present age. In a typical case of influenza with broncho-pneumonic complication the doctor comes and injects pneumococcic vaccine. His action is not followed by very hopeful results. He injects staphylococcic vaccine with no satisfactory result and subsequently he has recourse to streptococcic vaccine, and would continue to go on with his injections unless he be prevented by the patient or his friends. The human body is surely something more than a research laboratory! Professor B. C. Ray has given a fair trial to vaccine in the treatment of influenza, and I would ask him to write a paper on the subject. Of prophylactic treatment nothing is more safe and reliable than to quit the infected area and retire to a healthy locality. But this is a procedure which can never be adopted by the Indians, whose social customs are very much against it. The women of his family will cling to the bedside of the patient, to nurse him and do everything for his comfort, sacrificing the fundamental rules of hygiene. The slovenly habit of preserving the soiled linen saturated with sputum is to be condemned. The free use of eucalyptus or thymol inhalations is to be insisted upon. Occasional washing of the mouth and throat with common salt water will be a very useful prophylactic. It costs nothing but is of greater use than various medicated gargles. Free use of quinine sometimes prevents influenza, although opinions are not unanimous. The ammoniated tincture of quinine

has in many cases proved inert Quinine, Dover's powder and camphor sometimes act most beneficially in warding off an impending attack The treatment of broncho-pneumonia in influenza does not differ much from the ordinary routine treatment, but due care is necessary to protect the heart Strychnine and digitalis should be given according to the requirements of the case Insomnia is a constant complication of influenza and can be removed by the exhibition of Dover's powder and camphor Calomel relieves constipation Alcohol, which is very much deprecated by the leading men of the present age, is, in my opinion, an excellent thing and can be absolutely relied upon during prostration Musk and "makaradhwaj" are generally resorted to by irresponsible practitioners in anticipation that they may be of immense service in preventing heart failure This hybrid system of treatment is to be condemned Mercury can under no circumstances be a stimulant Aspirin and phenalgene are to be used with very great caution Rest in bed and avoidance of exertion are the only remedies to be relied upon in expediting convalescence

NOTE ON THE OPEN AIR TREATMENT OF PULMONARY TUBERCULOSIS IN MADRAS PRESIDENCY

By C F FEARNside,
Lieut.-Col., I.M.S. (retd.)

CONDITIONS NECESSARY FOR TREATMENT

THE open air treatment of tuberculosis mainly consists of placing patients in the most healthy surroundings in open air chalets protected from violent winds and dust, good food, and regulated rest and exercise As a result of this treatment, temperature falls, night sweats disappear, cough is lessened, appetite returns, sputum decreases, and marked gain in weight and vitality follows

The tuberculosis institutions of which I have personal experience in England ensured these conditions They were surrounded by many acres of grass land free from dust, with no dusty roads, and had wind screens in the shape of woods where patients could remain all day even in a gale

The treatment of tuberculosis in Madras presents a far more difficult problem than in Europe in the first place, owing to the higher temperature throughout the year (in England patients do far better in the winter than in the summer), secondly, there are few trees to act as wind screens and for shade, and thirdly, for many months in the year the winds are laden with septic dust

The three essentials for the open air treatment in this part of India are —(1) Equable climate, (2) numerous trees, both for wind protection and shade, (3) freedom from dust The first two can be had easily in the Presidency and only require selection in the one case and

time on the other, but the last is most difficult to secure One does not need to be a tubercular patient to know the discomfort to nose, throat and chest caused by the dust-laden winds of the south-west monsoon In those suffering from pulmonary tuberculosis strong winds have a very deleterious effect on the healing of wounded tissue, especially when the wind inhaled is laden with bacteria-carrying dust whose flora are easily pictured by exposing a Petri dish containing sterile nutrient agar for a few moments The healing of the lung cavities depends entirely on air free of micro-organisms One can readily realise therefore how difficult it is to alleviate the symptoms of late cases or help to cure early cases The open air treatment in India therefore resolves itself into pure air treatment, and how this may be procured I shall show

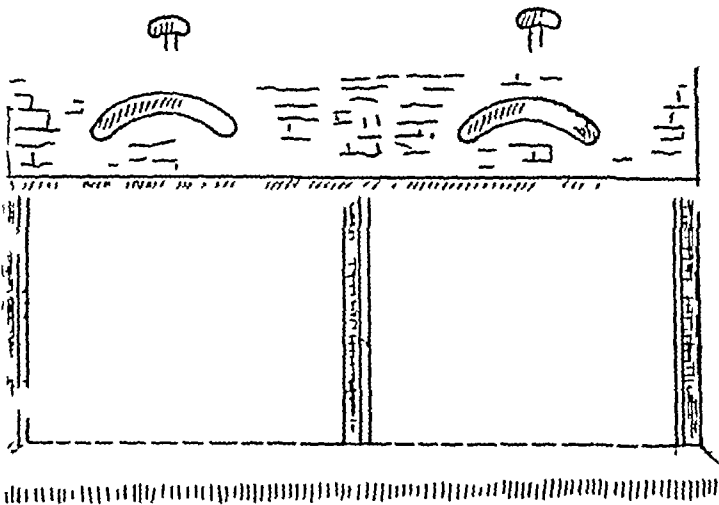
FARM COLONY

The ideal place is an island in some large tank or, failing that, any high land lying between two tanks, lying south-east to north-west with the institution placed between them Wind passing from the north-east or south-west and *vice versa* during the monsoons will be practically dust-free, most of its impurities being deposited in the water As the water recedes during the warmer months the grass growing in the bed of the tank will decrease the amount of dust whisked up from the ground and at the same time furnish useful grazing for the cattle required to supply milk to the patients During these months the dust nuisance can also be partly counteracted by cus-cus (farm grown) tatties with continuous irrigation from above The moist atmosphere generated will greatly relieve cough when a very dry and hot air is blowing, which is very irritant to cases complicated by posterior rhinitis, laryngitis, etc Another advantage is that the water of the tank can be utilized by the patients for gardening, and watering trees and hedges, besides growing crops In other words, a farm colony is most suitable for the outdoor treatment of the tuberculous

The sanatorium will shortly give place to the farm colony in the treatment of pulmonary tuberculosis, and I do not think there would be much difficulty in finding a suitable site such as I have mentioned where the dust nuisance would be greatly in abeyance Waste land might be taken up and artificial tanks made by utilizing the services of short-term prisoners to build the bunds No walls should be erected round the buildings, only an entanglement of barbed wire, of which there will be plenty available shortly from France It should be divided into two sections A—for latent cases and those in stages I and II, B—for advanced cases hospital which should be some distance away from A Section A should consist of chalets or well ventilated rooms, the usual treatment of rest and silence during certain hours being enforced in these chalets

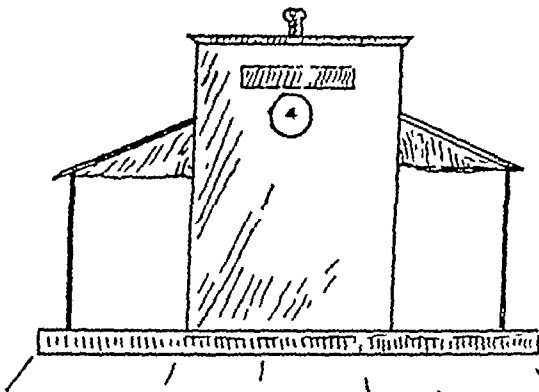
NOTE ON THE OPEN AIR TREATMENT OF PULMONARY TUBERCULOSIS IN MADRAS PRESIDENCY.

By C F FEARNside,
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CHÂLETS (ATTACHED)



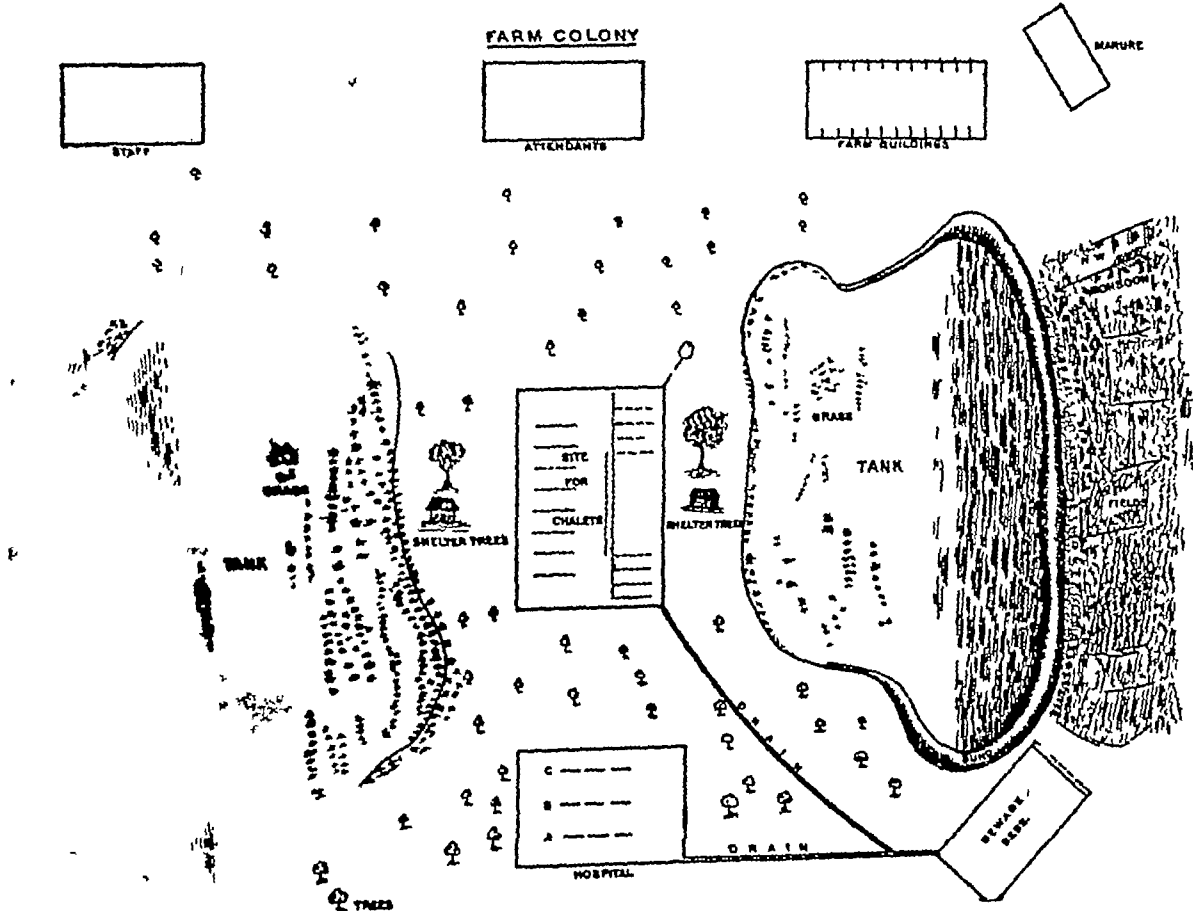
I

These can be constructed in rows open both in front and behind
so that there is a free passage of air going on
continuously.



II

SIDE VIEW OF No I
Tatties (cus cus) can be placed all
along the verandah.



CHAIRTS

The patients in stages I and II of the disease should be located in chalets. The ventilation can be decided by the double exposure system. It is not necessary to isolate the patients from those whose sputum contains tubercle bacilli. The rows of chalets can be arranged as patients in the different stages of the disease and according to the work and exercise proposed by the doctor. It is a well known fact that healthy attendants of a patient are not contaminated by the disease. The plan of chalets are suggested—(1) Decanted and (2) situated.

(1) Chalet with low parapet wall and the upper part open and protected by eaves or bamboo. There should be a verandah in front and behind where the patient can sleep peacefully in the open at night. The rooms need to be occupied during rest hours or in the evening. Room Mangalore tiles with the eaves of the building the eaves being extended well clear on both sides, or better still that of the straw. These chalets can be placed close to each other one another in rows. If necessary cement or Cuddipah slabs or red tiles. The chalet pillars, which retain the heavy roof or old eaves should be utilized to support the roof.

(2) In these the side ventilation will not be so good and the treatment will not be so effective. They should consist of a number of rooms side by side open in front and behind so that the air may pass freely through. These rooms should have deep double verandahs which help to keep the rooms cool during the day and can be utilized for the patients to sleep in at night.

HOSPITAL

The hospital buildings should be placed at a good distance away from the chalets. The hospital should consist of three wards. (A) for those who have a temporary setback, e.g., hemorrhage, pleurisy, systemic disturbance, (B) for those in the later stage, whose comfort should be mainly attended to since the prognosis is bad, (C) for surgical cases. It is better to have upstairs buildings open all round with verandahs on both sides so that patients may be placed in the verandahs when necessary. The wards should be open above with a wall of planking 3½ in to 4 in high to protect the beds from any strong winds, all above that being open. Iron uprights instead of brick pillars for the free passage of air should be utilized. Ordinary chucks or those of the roll top desk pattern or tatties of cus-cus for dust protection should be put up on both sides so that any strong breeze can be neutralised. A "D" ward should be cut off from the main ward at the end for moribund cases. The ground floor of the wards can be utilized for those patients who are able to come down during the day.

WORK

With an ample supply of water the patients can be employed in garden work, such as preparing the ground for vegetables, sowing seeds and weeding and especially planting tamarind, acacia and other good shade trees, but for how many hours a day this will be possible experience alone will determine. Working in the middle of the day in the hot sun may be found to be injurious on account of systemic disturbance, and it may be found necessary during the hotter hours of the day to employ the patients in open air workshops, chopping and sawing wood, weaving and other industries. Some alteration of the rest hours from those usually given in temperate climates may have to be made. During rainy days they will also have to be under cover. Open air workshops such as have been constructed for ordinary healthy prisoners in Coimbatore Jail are the most suitable, being of simple design and inexpensive.

For each patient should be allotted his work daily or weekly as the case may be, provided there is no setback, such as a rise of temperature, loss of weight etc. and he should wear a coloured disc on his coat indicating the work assigned him for the week. In a smaller institution this may not be necessary, but where there is a large number with several medical officers it is absolutely necessary to prevent patients doing other than their allotted work. The exercise begins with walking exercise and is graded up to heavy digging work and physical drill but all must have the prescribed hour's rest one hour before each meal during the day. In India this may have to be altered to several hours' rest in the middle of the day or it may be absolutely necessary to have the patients at work under cover during the hotter hours of the working day. Milk being an important and costly item in the dietary the patients can look after the cows which should form part of the farm colony, and thus help to diminish the expense of diet.

DISPOSAL OF INFECTED MATERIAL

The disposal of the faeces, urine and sputum in England is a simple matter as they pass into the usual sewers after disinfection. In India there is only the dry-earth system of getting rid of highly infectious material. It is a known fact that the tubercle bacillus is destroyed in a few hours if exposed to the sun in the tropics, but it may in favourable conditions survive for a year or more. It is not known at present how long the tubercle bacillus may remain virulent if buried with the nightsoil. The only safe method in my opinion is to dry and incinerate the infective material a method recommended in getting rid of *ankylostoma* and other ova. It is certainly inadvisable to utilize the nightsoil for gardening and farm manure because of risk to the herd or cows which will supply milk to the colony. The sputum mixed

with sawdust or chopped straw should also be incinerated. The watery elements of the sputum, urine and faeces can be evaporated in cauldrons over an oven and the dried material utilized as fuel. This, of course, should be done some distance from the main buildings in a special shed.

TUBERCULAR PRISONERS

It is proposed to construct buildings for tubercular prisoners to the north of Coimbatore Jail, the site alone costing about Rs 27,000. How far does this site meet the requirements for the successful treatment and alleviation of the symptoms of those affected? It is an open, treeless field, wind-swept during the monsoon months, with semi-black cotton soil. On the west side is a main artery to the town whence clouds of dust sweep across it daily during the south-west monsoon. It is within municipal limits (which fact alone condemns it) with rising suburbs to the east as well as to the west between which will be a number of tubercular patients in close proximity. The danger of the contaminated soil being blown to these areas is obvious, and no amount of training of Indians in protective methods will prevent their contaminating the soil for many years to come. They, however, are not alone in this respect, for it is very difficult to convince educated European patients of the danger they are to others. Another grave danger is the spread of the disease by flies. In Port Blair it was with the greatest difficulty that this nuisance could be kept down in the large tubercle wards, owing to the fact that the prisoners would not realize the danger of infection to others from this source. What applies to the two suburbs mentioned equally applies to the prisoners in Coimbatore Jail and the Police Recruit School, *viz.*, there is considerable risk of dried infected sputa, etc., being blown into the prison and thereby risking the health of the inmates. Incarceration at all times has a depressant effect, and if to this is added the frequent mental depression so common amongst those suffering from tuberculosis, how can any good results accrue? Further, high walls on still days become very hot and occlude any little breeze that may be blowing at the time and give off heat at night. This is not conducive to the reduction of temperature, which is one of the features of the fresh air treatment.

TREATMENT OF KALA-AZAR WITH INTRAMUSCULAR INJECTIONS OF HYPER-ACID ANTIMONYL TARTRATE (+URETHANE)

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SINCE the discovery of antimony as a specific in the treatment of kala-azar, attempts have

been made to discover a preparation which could be given intramuscularly without local reaction. The ordinary antimonial preparations, such as tartar emetic or antimonyl sodium tartrate, give rise to violent local reaction and cannot therefore be used intramuscularly.

Caronia has used acetyl-p-aminophenyl-stibiate of sodium intramuscularly in the treatment of infantile kala-azar with good results and subsequently it was used by Kharina-Marinucci.

In seeking for a preparation of antimony which will give little local irritation, we should use one which will be quickly absorbed without dissociation or decomposition. Such a preparation I have found in hyper-acid antimonyl tartrate (+ urethane). It is very soluble in water, stable in aqueous solution for indefinite periods, and is quickly absorbed without decomposition after intramuscular injection. As urethane is not a base, it probably remains in solution with the antimonyl compound in the form of a mixture.

Experiments are being conducted by me to determine its toxic dose as compared with its curative dose, and, so far as I have been able to determine, it appears to be the least toxic of all the antimonial preparations and its curative dose seems to be much smaller than that of other antimonial preparations. Further observations on this subject will be communicated in a future paper.

The following are the series of the first four successive cases which have been treated successfully with this compound. In each of these cases the diagnosis was made by the presence of the L. D. bodies in the spleen and the cure was shown by their disappearance therefrom —

1 Patient B S was admitted into my ward on 25-9-19, with the spleen extending 6 in below the costal margin in the left nipple line. He was given intramuscularly $2\frac{1}{2}$ c.c. of a 2 per cent solution of the hyper-salt with urethane. Altogether 14 injections were given from twice to four times a week. The results of treatment were as follows —

(1) R B C—2,800,000, W B C—1,800, Hb—46 per cent. on 26-9-19 (before treatment)

(2) R B C—4,700,000, W B C—13,800, Hb—60 per cent. on 5-1-20 (after treatment)

There is marked increase in weight, the spleen cannot be felt below the costal arch, and no L. D. bodies can be found on spleen puncture and the fever has subsided.

2 Patient M was admitted into my ward on 23-8-19 the spleen extending 5 in below the costal margin in the left nipple line. He was given $2\frac{1}{2}$ to 5 c.c. of a 2 per cent solution of the hyper-salt with urethane intramuscularly. Altogether 15 injections were given from twice to four times a week. The results of treatment were as follows —

(1) RBC—3 500,000, WBC—2,200, Hb—38 per cent on 8-9-19 (before treatment)

(2) RBC—4 600,000, WBC—16 000 Hb—60 per cent on 23-12-19 (after treatment)

There is a marked increase in weight and the spleen can just be felt below the costal margin and no L. D. bodies can be found on spleen puncture and the fever has subsided

3. Patient R. B. was admitted into my ward on 27-10-19 the spleen extending 3 in. below the costal arch in the left nipple line. He was given 17 injections intramuscularly in doses of 2½ cc of the 2 per cent solution every two to three days. The results of treatment were as follows —

RBC—3 000,000 WBC—2 200, Hb—46 per cent on 29-10-19 (before treatment)

RBC—4 000,000, WBC—10,400, Hb—60 per cent on 19-1-20 (after treatment)

There is marked increase in weight and the spleen cannot be felt below the costal arch and the fever has subsided and no L. D. bodies can be found on spleen puncture

4. Patient B. was admitted into my wards on 6-11-19 the spleen extending 3½ in. below the costal arch in the left nipple line. He was given only 5 injections of the hyper-salt with urethane at intervals of 3 to 4 days in doses of 2½ cc of 2 per cent solution

The results of treatment were as follows —

RBC—3 100,000 WBC—2,400 Hb—48 per cent on 12-11-19 (before treatment)

RBC—4 500,000 WBC—12 600 Hb—60 per cent on 20-1-20 (after treatment)

There is marked increase in weight the spleen cannot be felt below the costal arch and no L. D. bodies can be found on spleen puncture and the fever has subsided

As regards local irritation there is in some cases some amount of swelling at the site of injection which subsides quickly. No abscess or necrosis was found in any of the cases. The highest dose was 5 cc of a 2 per cent solution calculated in terms of the amount of Sb, O, present. No reaction in the form of rigors, high fever or cough was observed in any of the cases. The number of injections given up to now to all my cases numbered nearly 100. Another series of cases is being treated with the same compound.

I have subsequently found that a 1 per cent solution is almost absolutely painless. It appears to me that the use of the hyper-acid antimonyl tartrate is one of the greatest advances in the treatment of kala-azar.

Very recently I have prepared urea-acid antimonyl tartrate, and a trial is being given to it by intramuscular injection in kala-azar. The results of these observations will be published in a future communication. So far it seems to be promising.

ABSCESS OF BRAIN DUE TO CHRONIC EAR DISEASE

By KANTA PRASAD, M.D.,

MAJUT-COLONEL, I.M.S.,

Civil Surgeon, Myaungma

CHRONIC SUPPURATIVE OTITIS MEDIA is a disease the importance of which, as a menace to life is imperfectly comprehended by the general public, but, as the notes of the following case show, its presence carries with it a grave risk and at any time it may suddenly put an end to the patient's life by the extension of infective processes within the cranium.

Clinical history—A Burmese male prisoner, aged 29 years, was sentenced to two years' rigorous imprisonment on the 28th April, 1919 and on admission into the jail with the exception of a discharge from his left ear and deafness, he was apparently in good health. After the usual period of segregation he was passed as fit for hard labour. For nearly four months he got on very well. He occasionally came to the hospital to have his ear attended to, but he never had any temperature and never complained of headache nor indicated any brain symptoms. There was no bulging nor oedema over the mastoid and no tenderness to speak of. He gave a previous history of otorrhoea, but beyond this he had no memory of the early stages and could say nothing. There was no history of tubercle. On examining the ear with the crude means at my disposal, I noticed that there was a free discharge of pus from the middle ear and it was thin and smelly. The whole of the membrane had undergone destruction and the inner tympanic wall was widely exposed, secreting pus. As there was nothing to indicate the approach or actual presence of grave complications, operative interference was not considered necessary, and it was thought that syringing the ear with antiseptic lotions and hydrogen peroxide drops would do. Quite unexpectedly on the 15th August, 1919, he had a rise of temperature, and it was thought that it might be due to malaria. The fever, however, did not go down and he was therefore admitted into the hospital on the 19th and next day he began to show head symptoms and his condition became serious. He now complained of severe headache, vertigo and pain in the ear. He had a rigor and his temperature went up to 104.4 degrees F. The discharge smelt badly. On 21st he became delirious and began to pass faeces involuntarily in bed. The temperature did not come down, and it was thought that in this hopeless condition mastoid operation would do him no good. The case was too far advanced for operation, and at 3 P.M., on the 23rd, he expired.

A post-mortem examination was held next day. On removing the skull, the dura mater on the left side looked dark and congested. On cutting into it pus oozed out and the whole of the left hemisphere was covered with it. On

removing the brain the bones in connection with the left ear were found necrosed and the mastoid cells full of pus. On cutting into the brain the substance was found to be highly congested, the left lateral ventricle was full of pus and the choroid plexus dark and congested, in the right ventricle was sero-sanguineous fluid. The right auricle and ventricle of the heart contained ante-mortem clots. The spleen was enlarged, congested and friable.

An interesting point in this case is the complete absence of oedema over the mastoid, with no tenderness and no rise of temperature until meningitis actually set in and no signs of brain complications. Up to the 15th of August there was no complaint of anything except the presence of discharge and of deafness, which threw me off my guard and prevented me from doing the mastoid operation in time.

This disease must have existed in a quiet condition for years and slowly led to caries and necrosis of the bony wall, and yet there was nothing to indicate the approach of danger in this case.

RUPTURE OF GALL-BLADDER

By W C KANE, B.A., L.M. & S., Bom

Officiating Civil Surgeon, Khandwa, C. P.

VERY few cases of rupture of gall-bladder with gall-stones lying free in the peritoneal cavity are on record. As the following case, although it occurred some years ago, may be of some interest to your readers on account of its rarity and of the wonderful recovery she made I give it below with the kind permission of Colonel W H Kenrick, I.M.S., Civil Surgeon, Jubbulpore.

Miss K, aged 39, was admitted in the Victoria Hospital, Jubbulpore, on 10th March, 1910, with symptoms which indicated obstruction of bowels, *i.e.*, abdominal distension, vomiting (which was bilious and not faecal) and absolute constipation, not even flatus being passed. Pulse weak, rapid and thready. Features drawn and anxious looking, respiration thoracic. Unfortunately the temperature was not taken, as she did not appear to have fever. It was ascertained that the patient had a severe attack of pain in the region of gall-bladder early on the morning of the 7th March, 1910, which was subsequently referred to the right shoulder. Morphia did not relieve her much. Gradually the symptoms given above made their appearance.

Previous history—The patient was quite well till September 1902, when she began to have frequent attacks of bilious vomiting with sensation of discomfort in the right hypochondriac region. These attacks continued off and on till November 1909, when she got a typical biliary colic attack, since then, till the time of admission, off and on she used to have these attacks.

About a month before admission she was laid up in bed on account of the attacks coming on every third or fourth day. Her work necessitated irregular hours of food and moving about in the sun.

Operation—The abdomen was opened by Colonel Chapman, C.I.L., I.M.S., the then Civil Surgeon, in the middle line with the usual incision below the umbilicus, and some time was spent in searching for the seat of obstruction which was supposed to exist from the signs and the symptoms present. The coils of intestines were seen covered over with shreds of recent lymph, but no distinct lesion could be found although at one place in the small intestines a small cicatricial contraction was noticed, probably the result of some previous ulceration, but this could not explain the grave condition of the patient. Evidently there was peritonitis and there must have been some cause for it. Having had the history of biliary colic it was thought proper to explore the region of the gall-bladder, so an oblique incision about 4 inches long and about half inch below and parallel to the right costal margin was made and the abdomen opened. No sooner Colonel Chapman had put his hand in to explore the gall-bladder than he came across a good number of gall-stones lying free in the cavity, about 50 were taken out. They varied in size, the smallest being about the size of a gram seed and the biggest about the size of a walnut. It was found that the gall-bladder had been ruptured and there were adhesions all round. As the patient's condition at this stage was very critical, nothing further was done than putting in two glass drainage tubes—one at the bottom of the incision in the middle of the abdomen, and another in the second incision. The abdominal walls were hurriedly sutured together. The condition of the patient for the next two days was very serious. The pulse was thready and 140 per minute, although the temperature never rose higher than 100 degrees F.

The dressings had to be changed three or four times a day owing to the constant oozing out of bile through upper wound. Tympanitic condition of the abdomen and the tense feeling remained the same, on the 3rd day the tympanitis was slightly lessened and the patient passed flatus and a small clay-coloured motion in the middle of the night. The pulse also improved in force.

After this the patient made a gradual but uninterrupted recovery, the wound in the region of the gall-bladder having taken a little longer to heal up. She was discharged cured on 30th April, 1910.

Except a little digestive trouble occasionally, she appears to be in excellent health and is doing her work. No ventral hernia nor any attacks of biliary colic have occurred after the operation.

The only question in this case is whether one could have avoided the first incision.

A Mirror of Hospital Practice

FIFTEEN CASES OF OVARIAN TUMOUR TREATED BY OPERATION

By KSHETRA MOHAN GUPTA, M.D.,

Mohshadal Raj Hospital

Serial No	Age	Caste.	Menstrual history	Duration	Size of the tumours	Number of ovaries affected	Nature of the fluid and its amount	Weight.	Nature of the tumours	Complications	Emergency medicine adopted during operation	Special features of operations	REMARKS AND RESULTS
1	50	Hindu	Menopause	4 yrs	Coconut	One	2 pints of straw coloured fluid		Cystic	Adhesions to bladder in testine and omentum		Removal of piecemeal Bladder was punctured who saw atting adhesions (bleed by catgut sutures)	Bladder gave no trouble. Sitch abscess. Some of superficial stitches were removed on the 3rd day. Operated on 23rd March and discharged cured on 7rd May, 1911
2	40	Do.	Dysmenorrhœa	1½ yrs	Do	Do	1½ pints of tarry fluid	...	Do	Adhesions, a few		Shelled out	Uninterrupted recovery
3	35	Do	Amenorrhœa	2 yrs	3½" long, 30" broad	Do		.0 lb	Solid	Close adhesion to uterus	(i) Intravenous saline (ii) Strychnine ether	No stalk Tumour-shelled out by para-vascular hysterectomy	Uninterrupted recovery Operated on 10th July 1914 by charged cured on 11th August, 1914
4	44	Do	Scanty	1 yrs	Full term pregnant uterus	Do	8 pints of brownish yellow fluid		Cystic	Adhesions, a few			Uninterrupted recovery Operated on 18th August 1914 Discharged cured on 12th September, 1914
5	26	Do.	Menorrhœa	2 yrs	Orange	Do	4 ounces of straw coloured fluid		Do	Adhesions, a few uterine fibroids (i) Subperitoneal Size—(i) coconut (ii) Subperitoneal Size—Tennis ball (iii) Intestinal size—Orange	Strychnine, in digitalin injected	Supravaginal hysterectomy	Primary infection Operated on 27th November 1914 Discharged cured on 1st January, 1915

FIFTEEN CASES OF OVARIAN TUMOUR TREATED BY OPERATION—(Continued)

Serial No	Age	Caste	Menstrual history	Duration	Size of the tumours	Number of ovaries affected	Nature of the fluid and its amount	Weight	Nature of the tumours	Complications	Emergency methods adopted during operation	Special features of operations	REMARKS AND RESULTS
6	62	Hindu	Menopause	1 yr	Coconut	One		10 lb	Solid	Adhesions			Uninterrupted recovery Admitted on 26th April, 1915. Discharged cured on 12th May, 1915
7	35	Do	Scanty	1 yr	Full term pregnant uterus	Do	12 pints of straw coloured fluid.		Cystic	Do			Uninterrupted recovery in 24 days. Stitch abscess
8	34	Do	Amenorrhœa	2 yrs	Do	Do	10 pints of straw coloured fluid		Do	Do.			Stitch abscess Admitted on 12th January, 1916 Discharged cured on 23rd February, 1916
9	40	Mahomedan	Scanty	2 yrs	Do	Do		24 lb	Solid	Do		No stalk Shelled out.	Uninterrupted recovery.
10	28	Hindu	Do	1 yr	Do	Do	11 pints of straw colour ed fluid		Cystic	Do			Do
11	30	Do.	Do	2½ yrs	Larger than full term pregnant uterus	Do	30 pints tarry fluid		Do	Do			Biggest one operated reaching up to xiphisternal articulation Uninterrupted recovery
12	38	Do	Amenorrhœa	2 yrs	Full term pregnant uterus	Do			Partly cystic	Do	Strychnine injected		Uninterrupted recovery
13	40	Do	Do	3 yrs	Coconut.	Do	2½ pints of straw colour ed fluid		Cystic	Adhesions A sinus leading into the cyst due to tapping by a quack	Do	Intestinal wall torn open for 2" Closed by catgut sutures	No septic trouble Discharged cured within a month Primary union Stich abscess
14	40	Do	Scanty	1 yr	Orange	Do	3 cup p of yel lowish fluid.		Do	Nil			Uninterrupted recovery.
15	38	Do	Amenorrhœa	1 yr	(1) Coconut, (2) Orange	Both the ovaries were affected			Partly cystic	Adhesions, a few			Uninterrupted recovery within 20 days (1919)

ADHESIONS gave trouble in some of the cases

In most the tumour, after its contents were evacuated, was removed easily after ligature, by double interlocking ligatures, of the pedicle. The pedicle stump was covered with peritoneum. Those tumours which had to be shelled out had their sites covered by peritoneum carefully

stitched. The abdominal wound was closed in three layers, and the patients were kept on rigidly fluid diet for the first week. For the first twenty-four hours nothing save sips of hot water was given by the mouth. The dressing was changed on the seventh day, and on the

fifteenth all stitches were removed and the abdomen strapped. As a rule a dose of calomel was required on the third day. The patients were not allowed to walk about for a month after the operation and were given abdominal belts. All with whom touch is kept are in good health

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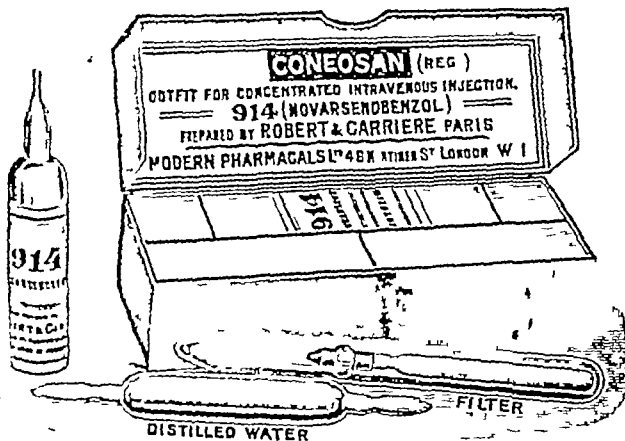
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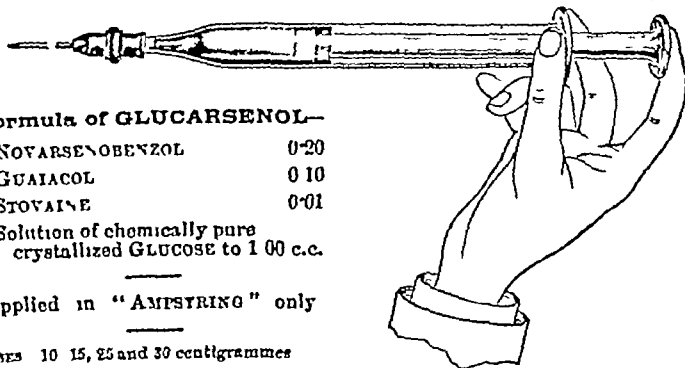
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Indian Medical Gazette.

MAY

DLATH IN THE POT

To the laity the symptoms of so-called ptomaine poisoning are well known. After partaking of the poisonous food, which in most cases contains no ptomaine, the unfortunate individual is suddenly seized with great pain in the belly, and passes copious watery, greenish and very offensive stools. He may also have distressing vomiting. Soon he becomes collapsed, with his skin bedewed with cold sweat, and he has a feeling of impending death. The temperature is generally elevated. Headache and giddiness may be prominent symptoms.

In such a case the patient will generally assert that the food "looked all right," or was certainly not tainted, for the popular belief is that for 'ptomaine-poisoning' to occur the offending material must be appreciably altered in appearance, smell or taste. But this is not so. Indeed so innocent may the food seem to be that at Ghent in 1895 the slaughter-house inspector, who was a veterinary surgeon, was so sure that the saveloy, which was suspected to be the cause of the outbreak of food-poisoning, was 'good' that he ate some of it to prove its harmlessness. He died on the sixth day, and from his body the *B. enteritidis* Gaertner was recovered.

This microbe was first isolated in 1888 by Gaertner, who investigated an outbreak of food-poisoning at Frankenhause, in which the flesh of a cow that had been killed because it was suffering from enteritis caused serious symptoms in many persons. From the organs of this cow, and from the body of the fatal case that occurred, this bacillus was isolated, and it and others of the group *Salmonella* are now known to be by far the most frequent cause of bacterial food-poisoning. This group comprises *B. enteritidis*, *B. paratyphosus A*, *B. paratyphosus B*, and *B. supestifer*, which latter type includes *B. typhi murum*, and perhaps *B. psittacosis*. Any of these may be conveyed to meat, vegetables or fruit by flies, which may harbour them in their intestines for seven days, by rats and mice, which may be healthy carriers of one or more members of the group, or by direct

contamination during the process of preparation, or after cooking, of the food.

Cooking may intensify the poisonous nature of the food, by slaying the saprophytes which are present and by their presence prevent the multiplication of pathogenic bacteria. Thus pasteurised milk and sterilised brawn become very dangerous when infected after exposure to heat. Besides, cooking does not by any means always imply the death of any pathogenic bacteria present. An over-baked pie had its centre heated only to 86.6 degrees C, a ham weighing 16 lb. after boiling for 2½ hours had an internal temperature of only 44.5 degrees C, a tin of meat that had been boiled for five hours had not had its centre heated to boiling point, and a dish apparently so easily cooked as is *spaghetti*, when cooked in a hot-air steriliser until it appeared to be *overdone*, had not had its centre even pasteurised.

More than this—the Gaertner group of bacilli can be killed easily enough by heating to 60 degrees C for half an hour, but their toxins are extremely resistant to heat. Even 100 degrees C for half an hour will not destroy them, which fact explains why meat, that has caused an outbreak of food-poisoning because the toxins of the bacilli which it harboured were intact, affords no material for culture, because the bacilli themselves had all been killed by the process of cooking.

Much has lately been written about botulism—sausage-poisoning. Its symptoms differ much from those of the ordinary food-poisoning. They are thirst, dysphagia, obstinate constipation, mydriasis, paralysis of accommodation, nystagmus, internal strabismus, and the temperature is never elevated, but generally sub-normal. There are no cramps, and consciousness is retained till the end. In fatal cases all the symptoms of bulbar paralysis may be present. As a rule the food which contains the *B. botulinus* is appreciably tainted. Were it the rule that the brine used to pickle meat should contain 10 per cent of common salt, botulism would be very rare, for the microbe that causes it cannot live if more than 6 per cent of salt be present. Ptomaines are poisonous, but are only produced when, as the result of putrefaction, the meat containing them has become far too offensive to be sold or eaten. "Tainted food is universally suspect, possibly quite justifiably suspect, but neither the degree of its malevolence nor the precise cause of its

harmfulness has been placed upon a scientific foundation"

These are a few of the points on which a recent work* gives us reliable, because carefully-sifted evidence. Obviously we in India should know all that there is to know about food-poisoning for the carelessness of the cook, the incurably dirty habits of many of the domestics, the high temperature of the air and its often great bacterial content with the frequent necessity of using tinned provisions, make the subject one of perennial interest to all of us

A GREAT MAN, a Prince of Science has left India. All through his service here he tried to save India from herself. How well he succeeded we of the medical profession know. When he came to India, tropical abscess of the liver killed its tens, dysentery its hundreds and cholera its thousands every year. Now, thanks to him, abscess of the liver is a rarity, for we all know that it is caused by amœbic dysentery and that when intelligently treated by means of emetine this dysentery is controllable. Whereas formerly 60 per cent of all treated cases of cholera died, and in some epidemics at their height the mortality reached 80 per cent, now this pre-eminently Indian disease slays only 20 per cent of its victims. When kala-azar was recognised as a clearly-defined disease it had already slain 35 per cent of the inhabitants of the Nowgong tract, and its spread thence was noted with foreboding. Now its spread has been checked, and its mortality instead of being 75 per cent is less than 5 per cent. Recently leprosy was looked upon as incurable, now we know that it can be cured in the earlier stage, and that in the later stages the hideous disfigurement caused by its ravages can be, to a great extent, prevented. Tubercle, the great white plague, had only a few cures and many, many failures to record as the result of treatment. Now there are indications that its fat-coated bacillus, like that of leprosy, can be disintegrated by the use of soaps introduced into the organism.

All this has been the work of one man, who has left behind him in India thousands who but for him would long ago have died. Could any man desire more glorious fruition of his life's work?

* Food-poisoning and Food-infections, by W. G. Savage, B.Sc., M.D., D.P.H. Cambridge, 1920. University Press. Price 15s nett.

Honours have come to him. The Royal Society has admitted him to its fellowship. The King-Emperor has created him a Knight Bachelor and bestowed on him the Companionship of the Order of the Indian Empire. Doubtless promotion in this or a superior order will soon be his, honour to whom honour is due.

But we are proud to think that of all things he rejoices in having had set up in the Calcutta School of Tropical Medicine a bust of himself which was subscribed for by those best fitted to judge of the benefits to humanity that have accrued from his work—his medical brethren. There is not a village in the wide world in which at least one man, the doctor, does not know and reverence the name of Leonard Rogers. He has gone Home to carry on his work on tuberculosis. Long may he live to work for the good of his fellow-men!

Current Topics.

The Diagnosis of Acidosis.

Charlotte Medical Journal, January, 1920,
Vol 81, No 1

ACIDOSIS has for years past been one of the helds of romance in medicine. The term has lacked a satisfactory definition, but has been used glibly in explanation of obscure conditions, often without a very clear conception of its real significance, and at times has been applied to conditions in which real acidosis can play no part. Moreover, unless the acidosis is marked, the diagnosis may present extreme difficulty. It is a great pleasure therefore to find such a clear and sanely critical review of the subject as that presented by Macleod (*Journal of Laboratory and Clinical Medicine*, 1919). He recounts the development in the use of the term, which was at first limited to the undoubted acidosis existing in cases of diabetic coma, then gradually extended to include all cases of acetonuria, and later included those conditions in which the acid production or retention involved entirely different types of acids. The difficulty in early diagnosis is depended partly upon the lack of an adequate conception of the disease process, but chiefly upon imperfection in technique of the methods used.

The desideratum is an estimation of the total alkaline reserves of the body. The author points out the difference between hydrogen ion concentration and titrable acidity, explains the errors inherent in titration methods when applied to blood or body fluids, and shows the superiority of the colorimetric method, using phenolsulphonephthalein and a set of solutions of known hydrogen ion concentration. The total alkaline reserves of the body are the alkalinity of the plasma, the alkalis of the corpuscles, the

protein of the blood and finally the alkalies and proteins of the tissue cells. The "buffer action" of these alkalies depends on the plasma on the ratio H_2CO_3 NaHCO_3 and in the corpuscles and tissue cells also upon the ratio between the dibasic and monobasic phosphates. Now the percentage of CO_2 in the alveolar air must be a measure of the available NaHCO_3 in the blood but in the methods now used

the alveolar CO_2 can serve as an accurate index of the acid base equilibrium of the blood only under certain controlled conditions and these conditions are difficult of attainment. Direct examination of the blood as to its content of NaHCO_3 avoids certain errors but still yields figures short of the total alkaline reserve of the body. The author prefers the method of Haldane which employs whole blood to that of Van Slyke which uses only the plasma. Methods combining blood and alveolar air examination are scarcely more accurate or informative. Another method whose value is still to be determined is to estimate the output in the urine of acid salts, salts of ammonia and free acid for when foreign acid is added to the body a corresponding amount must be eliminated by the lungs and kidneys.

In the opinion of the author the best test of acidosis at present available in routine clinical work is to determine "how much alkali can be added to the organism without causing the urine to assume an alkaline reaction". Normally this is very small about 5 gm NaHCO_3 but in acidosis may be as high as 100 gm a day. The value of this test seems to be established by experimental work. It is easy of application under all conditions and should be extensively employed in practice. Comprehension of the principles set forth and an appreciation of the relative value of the methods discussed, will serve to eliminate much loose talk concerning acidosis. It is to be hoped that the paper will be widely and carefully read for only in this way can its value be fully realized.

—*Medical Record*

Surgical Value of Certain Abdominal Reflexes

Lancet May 3rd 1919 Page 229—DAVID
LIGAT, F.R.C.S

THE writer emphasises the importance of a thorough investigation of the abdominal reflexes and suggests the following method of eliciting these. The patient lies on his back, with mouth slightly open and the arms by the sides.

1 The abdominal wall is pinched by grasping the skin and subcutaneous tissue firmly between the finger and thumb and drawing them away from the deeper layers of the abdominal wall. The first pinch should be applied to a point where a normal response is practically always met with, *e.g.*, the left hypochondriac region, and the facial expression carefully watched.

2 The various areas known to be associated with disease of particular organs are then tested.

3 Lastly the point of maximum intensity and spread of the hyperalgesia thus elicited is investigated. Spread usually occurs in a vertical direction.

The method separates the abdominal organs into two groups: 1—Lateral Gall-bladder appendix Fallopian tube 2—Central Stomach duodenum small and great gut.

The positions of the hyperalgesic areas are as follows—

The gastric and duodenal area—This area has its maximum point midway between the umbilicus and the ensiform cartilage.

The small gut area—Maximum point at the junction of the upper and adjacent fourths of a line drawn from the umbilicus to the symphysis pubis.

The large gut area—Maximum point at junction of lowest and adjacent fourths of a line drawn from the symphysis pubis to the umbilicus.

The gall-bladder area—The maximum point lies on the horizontal joining the tips of the tenth ribs and just inside the vertical line erected from the middle of Poupart's ligament.

Appendix area—The maximum point here is at the junction of the inner and middle thirds of a line drawn from the anterior superior spine to the umbilicus.

Fallopian tube area—Maximum point at junction of lowest and adjacent fourths of a line drawn from the middle of Poupart's ligament to the umbilicus.

The writer emphasises the fact that if this method is properly employed there is no pressure on the abdominal wall. Pressure on the abdominal wall gives rise to pain by stimulating the subperitoneal plexus of nerves which have been rendered irritable by local peritonitis. Pain due to pressure on a hyperalgesic area on the other hand, is due to upsetting of the equilibrium of the viscerosensory arc. The method described eliminates pain due to direct pressure.

If hyperalgesia corresponding to a particular organ is elicited one may conclude that that organ has been the seat of the primary infection.

The reflex arc is completed in the mucosa, as the experimental work of Kelling shows and not in the peritoneal coat of the viscus. Wingate Todd quotes Kelling as follows—

'The fact that each nerve which distributes branches to the abdominal wall also supplies twigs to the alimentary canal accounts for the hyperæsthesia and local contraction found in a part of the abdominal wall in diseases of the canal. It accounts, too, for the alimentary reflex, the relaxation of the abdominal wall

associated with distention of the alimentary canal. This is the reason for the tightness of one's clothes after a heavy meal. Owing to this reflex a dog can double its abdominal contents at a meal without inconvenience. That the arc is completed in the alimentary mucosa, and not in the peritoneum, is shown by the fact that the reflex is not called forth by the injection of air or saline solution into the peritoneal cavity."

There are two fallacies which must be kept in view —

1 A diseased viscus may give rise to no reflex

2 Two distinct intra-abdominal lesions may co-exist, *i.e.*, a chronic appendix and a growth of the pelvic colon—and the appendix may well produce a reflex and the colonic growth none

Action of Small Doses of Roentgen Rays

Ugeskrift for Læger, Copenhagen, November 27th, 1919 S1 No 48

EIKEN has been experimenting with Roentgen treatment in doses so small that the action of the rays seems to be restricted merely to a stimulating influence. Laboratory animals and fowls were treated in this way daily for months and then every third day up to a year, and none showed the slightest sign of injury therefrom. Their growth and procreation proceeded normally and their young procreated normally in turn. Similar experiments with animals inoculated with tuberculosis demonstrated that the reaction of the tissues to the tubercle bacilli occurred earlier and was more active than in the controls, the incipient foci healing. Applying these results to human beings, there seems a prospect of aiding the cure by this means in persons who display only a sluggish reaction, or the focus is located at a point where experience has always shown a torpid course. Without removing the clothing, the exposures were made for one minute from the front and from each side and for seven minutes from the back, and repeated every day or second day. The dose was 1/700 and 1/100 S N tablet. He gives the details of three cases of tuberculosis in which this treatment was applied. The stimulating action from it was unquestionable. The patients were 15 and 18 years old. In the superficial lesions the increased blood supply to the focus, the increased secretion and more pronounced demarcation were manifest, and then healing followed. One of the patients had tuberculous processes in lungs, cervical glands in skin and in the tibia, with several fistulas. A total of 100 exposures were made, and all the fistulas and external processes healed. The bacilli disappeared from the sputum for a long time, but scanty bacilli have appeared in the sputum again recently.

Bladder Radiography.

Presse Medicale, Paris, December 3rd, 1919
27 No 73

LEGRU AND PAPIN express surprise that the technic for pyclography has not been applied more systematically to the bladder. They have been using this cystoradiography, as they call it, since their publication on the subject in June, 1912, but found no reference to this method in the literature until Kelly's work in March, 1913. They have injected air, oxygen, bismuth, etc., but have found thorium sulphate or nitrate the best substances for the purpose. Thorium nitrate forms a solution which is not irritating or toxic, does not stain, and is less expensive than silver salts, etc. If a radiograph is taken of the bladder filled with fluid and then again after the bladder is emptied, any diverticulum shows up plainly, and this may explain the failure of persevering treatment, when cystoscopy has failed to reveal it. In one case two diverticula were thus revealed which had long maintained suppuration. Six instructive radiograms are given to show the different aspects of various lesions. A large tumor projecting into the contrast fluid renders the shadow within its outlines much lighter. In some cases the ureter mouth was gaping and the contrast fluid spread up through the congenitally dilated ureter, sometimes even into the pelvis.—*Jour A M A*

Causation and Treatment of Rickets

New York Medical Journal December 6th, 1919 No 23

"PRITCHARD holds the view which is that practically all varieties of malnutrition occurring during infancy and early childhood tend to terminate in rickets, provided they are sufficiently severe or long enough continued. They should not, however, be regarded as evidence of rickets, unless they are actually accompanied by the typical changes in bone which are characteristic of the disease. The essential and central feature of rickets he believes is the want of calcification or mineralization of developing bone, and this in its turn is due to existence of requirements for calcium which for the time being are more urgent than of developing bone. These urgent requirements are the necessity for neutralizing acid bodies in the blood, in other words, to neutralize or compensate an existing acidosis. In Pritchard's opinion, all chronic conditions of malnutrition of whatever kind or from whatsoever cause finally terminate in an acidosis and that all claims on alkaline bases arising in connection with the neutralization of this acidosis must be satisfied before those of developing bone are attended to. It is in the satisfaction of these claims for alkaline bases that the injury is done to growing bone"—*Jour A M A*

The Treatment of Thyrotoxicosis by means of Roentgen Ray

The Journal of the American Medical Association
November 20th, 1919—HOLMES and
MURPHY

The writers' paper is based on the results obtained in 262 cases treated during the last five years in the Roentgen Ray Department of the Massachusetts General Hospital.

Reviewing the literature on the subject the writers refer to Dr. H. J. S. Slocum's series of 48 cases, 14 of which were completely cured and of which 22 derived great benefit. Pittblat and Zuhke after a careful review of the literature and a study of their own cases come to the following conclusions:—

1. We believe that the first treatment for one series with an interval of waiting of one month is possible in all cases for it operates on nothing solid and many operations can in this way be avoided.

2. Treatment should be directed toward the thyroid and the thymus glands.

3. Increase in weight and decrease in pulse are the first signs of improvement and are practically always found.

4. Treatment must not be prolonged over too long a period or hypothyroidism may be produced.

5. The goiter and the exophthalmos are the last to show improvement and in many cases show no change.

Means and Aub in the *Journal of the American Medical Association* of July 7th, 1917, give their conclusions as follows:—

1. The general metabolism shows a characteristic increase in hyperthyroidism.

2. This rise may be used as a functional test of the thyroid activity or as an index of the intensity of the thyroid intoxication.

3. An extended study of the metabolism in various types of toxic goiter shows that:—

(a) Rest alone usually causes a marked decrease in toxicity.

(b) Drugs in addition to rest do not materially accelerate this decrease.

(c) The Roentgen ray, in some cases, produces a definite improvement while in others it seems to be quite without effect.

(d) The usual immediate effect of surgery is a marked decrease in toxicity, but there is a very definite tendency toward a subsequent recurrence.

4. The lesson in therapeutics to be drawn from these results we believe to be about as follows:—

(a) Complete rest in bed plus irradiation should be continued until the metabolism reaches a level.

(b) If rest and the Roentgen ray fail to restore the metabolism to within 20 per cent of the normal it is proper to resort to surgery, unless there is some definite contra-indication. Among contra-indications a rising metabolism,

in spite of complete rest, seems to be very important.

(c) Following operation, if the metabolism again increases further active treatment should be carried out. The observations in the cases that we have followed for a long time emphasize the importance of keeping cases of exophthalmic goiter under observation for months rather than weeks, and preferably years rather than months.

The present writers used Coolidge tubes run from an interrupterless machine. The parallel spark gap was approximately 8 inches and the rays were filtered through 4 mm of aluminium and 1 mm of leather. The target skin distance was 8 inches. Three areas were treated each sitting and two-thirds of an erythema dose was given to each area. Both thymus and thyroid regions should be treated. They recommend an interval of three months after each series of three treatments given at three weeks' interval.

The conclusions arrived at are as follows:—

1. It is possible to decrease the activity of the thyroid gland and probably to destroy its glandular structure by exposure to the Roentgen ray.

2. Roentgen ray treatment when applied in cases of thyrotoxicosis produces a relief of symptoms and shortens the course of the disease.

3. A study of the basal metabolism before, during and after treatment is of the greatest importance both as a means of diagnosis and as check on the amount of treatment to be given.

4. The Roentgen ray, accompanied by rest, should be tried in all cases of thyrotoxicosis and should be continued for a sufficient length of time to destroy at least the thymus before resorting to surgery.

The Schick Reaction

A VALUABLE AID TO DIPHTHERIA CONTROL?

IN spite of the remarkable and successful results which have followed the widespread use of diphtheria antitoxin, there is in this country a curious reluctance to adopt certain measures in control of the disease, which have already been extensively employed in other lands, notably in America. For this reason, a paper recently published in the *Lancet* by Dr. H. Mason Leete should receive all the attention it deserves. This author describes, and discusses primarily the Schick reaction for the determination of individual susceptibility to diphtheria and although he does not make any point which is essentially new to the literature on the subject, yet his clearly arranged words may well serve to light the flame of enthusiasm which is at present wanting. Many similar laboratory-controlled procedures have been handicapped by non-availability for general and institutional purposes of the required biological products but this cannot in this instance be the explanation since we can affirm that at least one large producing company is prepared to supply them in graduated and considerable quantities and is anxious to bring before both the medical profession and the local health authorities the possibilities of the method.

Admitting that most cutaneous reactions are far from infallible and that this one must be recommended with certain reserve as mentioned later, yet in view of the prevailing lack of precise knowledge on the subject, we find excuse for outlining the essentials of the Schick test as actually employed. Many articles, statistics, and temporary conclusions are found in the current medical journals of the U S A, but in that country the observational work is already so far advanced that they are not always easy for the uninitiated to follow.

To begin then at the beginning, the Schick test is carried out by injecting a very small dose of diphtheria toxin into the skin. This injection should be *intra-cutaneous* and of accurate quantity, which is in practice about one-fiftieth of a minimal lethal dose. The best site is the flexor aspect of the forearm, just below the fold of the elbow, and a round white wheal about the size of a large split pea should be formed. We may quote from Dr. Leete's own experience as to the typical positive reaction, but for variations, discrepancies, and difficulties we must refer the reader back to the author's article. "A typical positive reaction begins to show distinctly in from 24 to 48 hours, and reaches its height about the third day. It is a sharply circumscribed area of redness, with definite, though slight, infiltration, circular or somewhat oval in shape, and varying from half to one inch in diameter. This persists for about a week, and on fading leaves a brownish pigmented area which shows traces of desquamation. A negative reaction is shown by the absence of redness and infiltration, after 24 to 48 hours nothing can be seen, except a point of redness marking the needle track."

It is beyond the scope of this note even to outline the many experiments by which either the American physicians or Dr. Leete have arrived at their favourable conclusions, but after perusal of both, we feel justified in stating that the balance of evidence suggests the test to be of very definite value in detecting diphtheria susceptibles, and has, accordingly, many applications. Certainly it is very easy to perform and apparently free from any danger. Also, it would, although dependent upon the presence of corresponding anti-bodies in the blood, appear to be much more reliable than the known tuberculin reactions. If general experience runs parallel with that of Dr. Leete in finding an error of not more than 1 to 2 per cent, then its value is amply confirmed, but here it must be noted that a large portion of the evidence is obtained from people passively immunised with diphtheria anti-toxin.

What we must with relative certainty know is whether the Schick test can be relied upon to the same extent to indicate the presence, or absence, of natural anti-toxin and a consequent natural immunity. Dr. Leete's later experiences, and to a greater extent the American statistics, go a considerable distance towards proving that the wider application is justified, and, if so, the possible benefits which may result are manifold.

Diphtheria as a disease works its most deadly and most frequent ill upon young children, particularly upon those recently suffering from catarrhal and inflammatory conditions of the mucous membranes of nose and throat. Typically we see this in scarlet fever and measles convalescents. To be able to detect at least those children which are the more susceptible to such secondary diphtheric infection would be valuable for the patients and attendants alike, and opens up the possibility of guided production of protective passive immunity.

So much for the outlook in hospital and institutional practice and the question arises as to how far the same process can be applied to the general public. Except for that section which comes under the direct control of the local health authorities, although the indications would be identical, the practice of turning them to advantage would not be so easy. Through the agency of the school medical service the second most valuable possibility arises and in this connection

it must be pointed out that for some time past the New York Board of Health has, when possible, applied the test to school children, with results known to be most favourable.

Therefore would we urge that more practical and experimental attention be given in this country to the Schick reaction, since, valuable though limited local observations are, it is only by extended trial over a considerable section of population that a satisfactory conclusion can be drawn. Possibly the subject might with advantage be taken up by the Medical Research Committee—*The Hospital*

Is Vitamine Identical with Secretine?

[Also in Dutch]—*Meded. Geneesk. Lab. de Weltevreden* 1918 3rd Ser A No 1 & 2 pp 99-104—B C J JANSEN

THE author states how desirable it is to be able to determine definitely, quickly and quantitatively whether a substance or preparation contains vitamine or not. He mentions the methods that have been employed, such as observing the curative results on birds which have been experimentally affected with polyneuritis, the amino-acid-nitrogen increased output on a vitamine poor diet, the amount of degeneration of nerves dependent on deficiency of vitamins in the diet, etc., all of which methods are unsatisfactory. Bréudart and others have asserted that secretine and vitamine are identical, if this is the case, "the amount of pancreatic juice which is secreted in a given time after injection of the substance to be examined might be an indicator of the quantity of vitamine contained in that substance. For we know from the experiments of Bayliss and Starling that injections of secretine do cause such an increase. Dogs were used for the experiments, these were narcotised with morphine, a duodenal fistulous opening was made and a cannula passed into the pancreatic duct. Secretine was injected into the jugular and, after its stimulating action had ceased, a filtered extract of rice bran vitamins was injected and in one experiment a final injection of a further amount of secretine. These experiments showed that the effects of secretine were different from those of vitamine, therefore the two substances are not the same; the former stimulating pancreatic secretion, the latter not doing so.

The author also demonstrated that intravenous injections of a watery solution of a filtered bran extract caused almost immediate death of animals, this poisonous action is due to the contained potassium salts, and therefore if it should be decided to inject vitamine solutions intravenously for curative purposes, these should be deprived of their potassium salts—*Tropical Diseases Bulletin*

Report on the Anti-Beriberi Vitamine Content of Three Kinds of Atta Biscuits.

Indian J. Med. Res. 1918 July Vol 6 No 1 pp 56-57 With 6 figs and 1 chart
—E. D. W. GREIG and DAGMAR F. CURJEL

THE experimental results with pigeons, which were treated with three kinds of atta biscuits, are given in full. The three samples contained respectively 5 per cent, 10 per cent and 15 per cent of wheat gram embryo. Preventive experiments showed that the 15 per cent biscuit was very rich in anti-beriberi vitamine, as nine grammes on alternate days with polished rice fully protected the bird. Thirty grammes of 10 per cent was equally successful, but 15 grammes was insufficient. Sixty grammes of 5 per cent atta biscuit given in the same way was unable to protect, therefore the 5 per cent biscuit is much less efficient than the 15 per cent biscuit as regards protective powers against beriberi.

Food which had developed evidences of polynucleosis were quickly cured by about 10 grammes of the 15 per cent. biscuit. It is therefore evident that the 15 per cent. biscuit is a food of a high proportion of antiberberi vitamins and could be recommended for the use of the troops and be issued as an emergency ration. — *Tropical Diseases Bulletin*

Report on the Anti-Berberi Vitamine Content of Ground-Nut Meal Biscuits

Indian Med. Gaz. 1918 Oct Vol 6 No 2 pp 143-146 — D W GILL

THE experiments with the ground nut meal were similar to those carried out with all biscuits reported above. The investigation showed that the ground nut meal biscuits contained anti-berberi vitamins as the 15 per cent. biscuits. Therefore the ground nut meal whether in the form of bread or biscuit would be suitable for a part of an emergency or other ration for use by the troops. — *Tropical Diseases Bulletin*

i An Unclassified Form of Long Continued Pyrexia in Mesopotamia (Disseminated Nocardiosis)

Indian Med. Gaz. 1918 Sept Vol 53 No 9 pp 321-328 With 3 charts — C A SPRAYSON Preliminary Reports with a Pathological Description by F P MACKIE

ii An Unclassified Form of Long Continued Pyrexia in Mesopotamia (Disseminated Nocardiosis)

Ibid 1919 Jan Vol 54 No 1 pp 35-36 — F P MACKIE

1. Ten cases of an irregular prolonged fever are reported from hospitals in Mesopotamia. These resembled kala azar in that there were periods of prolonged fever with apyretic intervals, a large spleen, slightly enlarged liver, pigmentation of the skin, leucopenia with relative decrease of polynuclear cells, but in no case could Leishman bodies be demonstrated during life or post mortem. The cases in addition all showed pleuritic or pulmonary signs especially at the base of the right lung. The ten cases included four British soldiers and six Indians with one death among the former, most of the others being sent to base hospitals where their further course will be followed up. Clinically the cases had to be differentiated from kala azar, tuberculosis and malaria. In one case only tubercle bacilli were found but investigation did not support any of these diagnoses the true character being in doubt as laboratory methods failed to substantiate any known disease. Mackie however by staining the tissues obtained from the fatal case by Gram's method, was able to demonstrate in the lungs and adrenals a considerable amount of delicate mycelium not associated as in actinomycosis cases with small celled infiltration.

The spleen also showed quantities of pigment granules quite unlike those of malaria which he considered to be conidia granules due to a disseminated fungus infection. From other cases of a similar nature examined since at Baghdad he has actually cultivated a fungus of streptothrix character. The fungus resembles in morphological and cultural characters the *Discomyces asteroides* of Eppinger (1890). The disease may therefore, be described as a disseminated nocardiosis.

These observations are of extreme interest and no doubt further investigation will bring to light other cases of this curious condition, which is probably infective.

ii Further investigation has shown that the suggested diagnosis of certain cases of long continued

fever somewhat resembling kala azar, as possibly a form of "disseminated nocardiosis" was probably not correct. The fungus-like tuft which was found being the result of outside contamination. One of the most typical cases was proved after death to be kala azar although two ante-mortem punctures had been negative. If the long continued fever cases described by Col Sprayson are a separate entity their causative organism has yet to be found. — *Tropical Diseases Bulletin*

The Relative Content of Antiscorbutic Principle in Limes and Lemons together with Some New Facts and Some Old Observations concerning the Value of "Lime Juice" in the Prevention of Scurvy

Lancet 1918 Nov 30 pp 735-738 — HARRITT CHICK, E MARGARET HUME RUTH F SKELTON and ALICE HENDERSON SMITH

THE contents of this interesting paper are sufficiently presented in the author's summary —

"1. The antiscorbutic value of the juice of fresh limes (*Citrus medica* var *acida*) has been compared experimentally with that of fresh lemons (*Citrus medica* var *limonum*) and has been found to be distinctly inferior. Volume for volume fresh lime juice possesses a potency of about one-fourth that of lemon juice. In one instance severe scurvy developing in a monkey on a diet containing a small daily ration (5 ccm) of fresh lime juice was cured by an equal ration of fresh lemon juice.

"2. Preserved lime juice was found useless for the prevention of scurvy by the method employed. Experiments with preserved lemon juice are still in progress but give promise of better results.

"3. The experimental results are fully confirmed by a historical study of 'lime juice' in connexion with human scurvy. At the period when scurvy was eliminated from the British Navy by its agency the term was used to express the juice of lemons and it was not until the second half of the nineteenth century that the juice of West Indian limes was adopted in the Navy and Mercantile Marine. The history of two Arctic expeditions that of the *Investigator* 1850, and that of the *Alert* and *Discovery* 1875 has been carefully investigated. The former supplied with lemon juice experienced remarkable immunity from scurvy during the first two years of great difficulty and privation, the latter, supplied with lime juice, suffered severely from scurvy at the end of the first winter spent in the Arctic regions.

"It should be noted in connexion with these facts that scurvy is a disease with a long period of development. As much as four to eight months upon a defective diet may elapse before definite symptoms of scurvy can be observed." — *Tropical Diseases Bulletin*

Beer and Scurvy, Some Notes from History

Lancet 1918 Dec 14 pp 813-815 — ALICE HENDERSON SMITH

BEER has been used as an antiscorbutic since the voyages of Barentz in 1594-7, at first in the form of spruce beer, then as sweet-wort, made by pouring boiling water over malt and leaving to stand. In the middle of the last century when the Franklin Search ships left this country and the United States, the malt used in the preparation of beer or sweet-wort was "high-dried kilned malt" so that, as the author observes, "the essential element was removed without its importance being observed and the traditional belief now pertains to a beer from which the antiscorbutic value of the germinated malt has been removed unwittingly by the improvement of the malting processes." It has never been claimed that the use of beer is a complete protection against scurvy.

and lemon juice has removed the need of it. Reference is made to Captain H. Dyke's paper (see this *Bulletin* Vol 13, p 33)—*Tropical Diseases Bulletin*

A Note on the Value of Germinated Beans in the Treatment of Scurvy, and Some Points in Prophylaxis.

Lancet 1918 Dec 14 pp 811-813—H W WILTSHIRE

SERBIAN soldiers, apparently at Salonika, were thus treated for scurvy in 1917, owing, however, to delay in procuring the beans only a few and slight cases were available. Haricot beans were soaked in water for 24 hours and placed in perforated tin trays for 48 hours to germinate, being kept moist with free circulation of air, afterwards 10 minutes boiling was sufficient to render them edible. In one ward each scurvy patient received 4 oz of fresh lemon juice daily, in another a portion of germinated beans which had weighed 4 oz in the dry state, other forms of treatment were the same—admission to the wards was alternate. Of 30 patients treated with lemon juice and 27 with beans, 53.4 per cent of the former were cured within 4 weeks, and 70.4 of the latter. In another series of 21 cases when under 4 weeks lemon juice treatment progress was slow it was accelerated by the substitution of germinated beans. A consideration of the Serbian ration shows that the meat supply, part frozen and part tinned, was devoid of antiscorbutic properties. The majority of the patients had received one or two issues of potatoes with rice weekly and one of onions, and 16 had received onions daily and spinach and potatoes twice a week. The development of scurvy on this diet can only be explained on the assumption that the antiscorbutic vitamins were destroyed in cooking. With respect to cooking, heat and altered chemical reaction are under suspicion and it is shown that in this case heat was probably responsible, so that vegetables should be boiled only to the absolute minimum required to make them digestible. It is considered that, if an addition of vitamin containing substance is needed, germinated pulses provide the easiest and cheapest form of this addition, especially when it is remembered that beans are food and lemons are not. If heat is insufficient for germination a hot-bed of horse manure, if available, will supply it. With regard to the fact that the prescurbutic period is 2-4 months, it is concluded that preventive measures in Europe should commence not later than November.—*Tropical Diseases Bulletin*

Canned Tomatoes as an Antiscorbutic

Proc Soc Experim Biol and Med 1918 Oct 16 Vol 16 No 1 pp 1-2—ALFRED F HRSS and LESTER J UNGER

Preliminary Observations on the Value of Raw and Dried Tomatoes as Antiscorbutic Foods for Guinea-pigs.

Ibid pp 2-3—MAURICE H GIVENS and HARRY B MCCLUGAGE

SERIES of guinea-pigs were fed on diets of hay, oats and water with and without the addition of 5 cc. of canned tomatoes. These died of scurvy, those were protected, as is shown in a graph. Canned tomatoes have been given to babies in lieu of orange juice with good results.

The same effects were obtained with a different diet and 10 gm of raw tomatoes, used either preventively or curatively. Tomatoes dried under conditions described retain some of their antiscorbutic properties.—*Tropical Diseases Bulletin*

Infantile Scurvy; The Antiscorbutic Factor of Lemon Juice in Treatment

Lancet 1919 Jan 4 pp 17-18—A HARDEN, SYLVESTER S ZILVA and G F STILL

THIS paper merits a brief notice as the substance described will probably prove of value in adult scurvy. Harden and Zilva have shown that after the removal of free citric and other acids from lemon juice, the residue, which contains about 15 mgm of solids per cc retains antiscorbutic activity. Four cases of infantile scurvy are described in which the remedial effects were remarkable. The antiscorbutic is given in concentrated form and hence in much larger amount than could be taken in the form of lemon juice, the unessential and irritant part is eliminated. The results obtained in animals are thus confirmed.—*Tropical Diseases Bulletin*

The Antiscorbutic Properties of Concentrated Fruit Juices

Jl Roy Army Med Corps 1919 Jan Vol 32 No 1 pp 48-56—A HARDEN and R ROBISON

As a result of experiments on guinea-pigs the authors reached the following conclusions—

"(1) The antiscorbutic principle in orange juice is not volatilized when the juice is distilled at 40 degrees C under reduced pressure.

"(2) By evaporation of orange juice at 40 degrees C under reduced pressure it is possible to obtain a solid residue, which possesses the antiscorbutic value of the fresh juice in a very high degree. This value is not appreciably diminished when the substance is kept in a dry atmosphere at room temperature during six months."

Guinea-pig experiments by Robison on apple juice, concentrated by a method which entailed heating to 102 degrees C for less than one minute, showed that it possesses very valuable antiscorbutic properties though not in the same high degree as the dried orange juice.—*Tropical Diseases Bulletin*

A Note on the Occurrence of Negri Bodies

Indian Jl Med Res 1918 Jan Vol 5 No 3 pp 478-480—J W CORNWALL

"It has been held that it would be possible to decide by a microscopical examination of the brain of a man, who had died from hydrophobia after undergoing a course of anti-rabic inoculations, whether death had been due to the street-virus originally introduced by the bite or to the fixed virus used in the treatment, death from street-virus would be denoted by the presence of large Negri bodies, from fixed-virus by the absence of Negri bodies, except perhaps a few minute dots. The experience of this laboratory is not in favour of the view that large Negri bodies are never found after death from fixed-virus infection so it is concluded that, neither the presence of Negri bodies in the brain of a man who has succumbed from hydrophobia nor their absence from it can be relied on to decide whether the bite or the remedy caused the fatal issue"—*Tropical Diseases Bulletin*

Treatment of Cholera

Que faire en cas d'épidémie de choléra? (Une médication causale du syndrome diarrhéique)

Rev Méd Suisse Romande 1918 Sept Vol 38 No 9 pp 555-569—VICTOR KUHNÉ

THE author's experience gained while in charge of a hospital at Nish after the peace of Bukarest (Balkan War) leads him to place the greatest reliance on Stumpf's bolus treatment, to the exclusion of all others, including hypertonic saline injections, which

he dismisses as merely symptomatic. He claims to have been able to reduce the mortality from 45 to 2 or 3 per cent. The method is to mix equal volumes of water and bolus alba (kaolin) putting the latter into the former (about 100 gm of kaolin to 1 litre of water) and allowing the patient to take a glassful cold every hour or half hour. It is rarely necessary to take more than 6 glasses (equal about 200 gm kaolin) in the first 12 hours. Generally the vomiting soon ceases, the pulse improves and the patient sleeps. During the second 12 hours and the following day one gives according to the patient's condition several glasses of the mixture then for a few days a light diet. If the case is treated in this way from the beginning cure results in 24 hours and the patient can leave the hospital in 3 days. Should the case be so bad that the stomach and intestines are tonic, the bolus mixture must be given by stomach pump, or if that is not possible, as an enema. It is important that during the 18 hours which follow the beginning of the treatment except for water, neither food nor drink should be given.

All forms of gastric disturbance whether due to cholera nostras or metallic poisons, etc., are benefited by this treatment which apparently relies upon the great absorbing power of the fine particles of aluminium silicate. An interesting history of the drug accompanies the paper—*Tropical Diseases Bulletin*

The Prophylaxis of Malaria

Jl Roy Army Med Corps 1918 July Oct
Vol 31 Nos 1, 4 pp 60-75, 272-276—
G T RAWNSLEY, R A CUNNINGHAM, and
J WARNOCK

THE authors, considering the question from the army standpoint, allow some elasticity to the term prophylaxis and follow the logical course of including the cure of individual infection as an important part of rational communal prevention. This was a foretime a paradox but now the times give it proof. Their conclusions, which though not novel have confirmative force, are that for the eradication of malaria the following are the chief points to be attended to (a) the destruction of the mosquito throughout all stages of its existence, by draining and training, by oiling or cresoling of pools by clearing of brushwood and undergrowth, by traps and by destruction of adults, particularly when hibernating, (b) the protection of men from mosquitoes by choosing proper sites by mosquito-proof buildings, nets, veils, gloves, and deterrent ointment (c) the cure of infected men, or their removal, (d) the maintenance of a high standard of general sanitation. This last point has great significance when one considers that it must have been chiefly as a result of improved sanitation and a general amelioration of the conditions of life that malaria silently died out in this country.

Individually "prophylactic" quinine *per se* the authors consider useless, mainly because in one year five-grain doses twice a week (usually on two consecutive days) did not preclude a high occurrence of malarial fever, nor in the next year did ten grains twice a week, or ten grains every other day, or ten grains four days a week, or ten grains every day. The case thus stated certainly looks bad, but the data are not sufficiently precise and comprehensive to justify such verdicts as "useless," "futile," "positively dangerous," against quinine taken with a view to prevent infection of a perfectly malaria-clean individual.

Quinine given to prevent relapses—what in the authors' scheme of prophylaxis might be termed communally-protective quinine—is also thought to be uncertain and disappointing, and here again the authors seem to take a desponding view which their own observations do not vindicate.

A company, 104 strong, of which nearly every man had had malaria (the worst infested company of a badly infected battalion), was in October-November

put on a four weeks' course (as far as possible) of quinine (gr 30 daily) and arsenic. While under treatment the men carried on their ordinary duties. During the month of treatment only 2 cases, and during the month following treatment not a single case, of malaria occurred in this company, whereas in the same eight weeks about 150 cases of malaria and undiagnosed fever occurred among the men (about 500 in number) of the rest of the battalion.

Again during the winter months the whole of an army corps was put piecemeal on a 24 days' course of quinine (30 gr daily) combined with arsenic, or with iron strychnine and arsenic. Altogether 38,433 men received the treatment, of whom 23,071 were actually known to have had malaria. During the term of treatment 424 relapses occurred, during the first month following treatment 1,695, and during the second month 2,750. Thus the total number of relapses within 2 months and 24 days (*circa*) was 4,869 equals 21.08 per cent of men actually known to have suffered from infection, and 12.66 per cent of the total strength (which very likely included other malarials besides the 23,071 identified as such). Furthermore the general opinion of medical officers was that by this treatment the general state of health had been vastly improved, many admissions to hospital avoided, and the treatment of hospital cases rendered more amenable. In the face of this experience it is a hard saying of the authors that "curative" quinine is "uncertain in its action and disappointing in its results," *quacunque* and *qualitercunque*—*Tropical Diseases Bulletin*

The Clinical Rôle of the Fat Soluble Vitamine its Relation to Rickets

The Journal of the American Medical Association, January 24, 1920—HRS and UNGER

THE writers state that about a year and a half ago they undertook the study of rickets in about 100 infants cared for in a modern child-caring institution. The children under observation were placed on various diets—an abundance of fat soluble vitamine in the form of milk and cream, a deficiency of these substances as in skimmed milk, an abundance of water soluble vitamine as supplied by autolyzed yeast, or diets such as Mellin's Food. In all cases there was but one deficiency in the diet, which was adequate in quantity, that is to say in calorific content, and contained in every instance sufficient antiscorbutic foodstuff.

In their preliminary remarks the writers state that beading of the ribs, especially in conjunction with enlargement of the epiphyses, furnished the most reliable criterion of the course of the disease. They admit, however, that beading of the ribs may also be a feature of infantile scurvy and may even come about as the result of a lack of the water soluble vitamine. They also found that rickets can develop notwithstanding an abundance of fresh air and light. So much for the domestication theory of von Hansemann, and the respiratory poison theory of Kassowitz.

In order to study the influence of the fat soluble vitamine they placed a number of infants during the first months of their lives, on large amounts of milk, in some instances giving cream in addition. The dietary also included orange juice. In some cases a mild degree of

rickets was observed, but in others marked symptoms developed

The comment on their findings and their conclusions are as follows —

Our experience leads us to believe that except under exceptional circumstances—as in time of war—the danger to the infant and to the child from a deficiency of the fat soluble factor is one not to cause great apprehension. It is true that this principle is by no means so widely distributed in nature as the water-soluble vitamine, but, on the other hand, infants seem able to thrive for long periods on very limited quantities, provided the diet is otherwise complete. The great danger arises from diets composed merely of cereal and water or perhaps an insufficient amount of butter milk or skimmed milk. It is probably true that a catastrophe will result if the incomplete diet is maintained for years, or even sooner in a susceptible individual, as is well known to be the case in scurvy or in beri-beri. In formulating dietaries for infants and children therefore, this food factor should be borne in mind and be regarded as an essential constituent.

There is a growing danger of attributing every unexplained growth impulse to the new, attractive, but ill-defined vitamins—of their sharing with the secretions of the endocrine glands the fate of becoming the dumping-ground for every unidentified factor. It should be borne in mind that there are other little understood factors and food reactions. One of these is the peculiar and almost specific rôle that cereal plays in the nutrition of the infant. This phenomenon has been of especial interest to us for some time, and well illustrated the complexity of nutritional problems.

Not infrequently infants receiving diets which, according to accepted standards, should be adequate, fail to gain until cereal is given in addition. These babies usually are 6 months or more of age, and receive milk mixtures that should suffice to bring about growth. As the result of such experience, physicians add cereal to the milk diet when there is a failure to gain about the second half year of life. In order to obtain more precise information in regard to this interesting phenomenon, for which there is no satisfactory explanation, we studied a number of infants who had reached this stationary phase. It was found that in cases in which even cod liver oil no longer caused a gain, and in which egg yolk and beef drippings had failed, a small amount of wheat cereal (cream of wheat) brought about a decided increase (Chart 8). This result occurred whether the previous diet had been rich in fats, as just instanced, or contained a carbohydrate such as Mellin's Food (maltose and dextrin, Chart 8). In one instance, when large amounts of autolyzed yeast failed to stimulate growth, the wheat cereal was effective (Chart 8). Another, a breast-fed baby, aged 8 months, which had not gained for three weeks, increased 6 ounces as

soon as a small amount of cereal was given in addition to the nursings. These gains could not be due to an addition of any of the recognized vitamins, as diets rich in the antiscorbutic, water-soluble and fat-soluble factors were nevertheless enhanced in value by the cereal addition. Nor could it be the result of a simple caloric increase in food, for the amount added was comparatively insignificant. Cooked cereal equivalent to only 2 or 3 gm of the dry cereal frequently led to a gain of 2 or 3 ounces by the following day. These babies were receiving a high caloric diet. In one instance a quart of protein milk and 30 c.c. of cod liver oil were given, representing about 120 calories per kilogram of body weight (Chart 8). The simplest and most direct explanation of this reaction is that this carbohydrate brings about a more complete oxidation and thereby a better utilization of the food. However this may be, it illustrates the point that not everything which induces growth—and which does not conform to accepted standards—is a vitamin.

CONCLUSIONS

It would lead too far afield to discuss the various theories that have been advanced to account for the occurrence of rickets, and, moreover, it would not be profitable at the present time, as the data are inadequate. There seem to be several causes at work, rendering the unravelling of the problem so difficult that there is a difference of opinion not only as to the particular dietary factor that is at fault, but even as to whether rickets is to be considered a disorder of dietetic origin. It should not be lost sight of that there is a prenatal factor involved. The fact that the Negro infant, living side by side with the white in the larger cities and obtaining a milk from the same source, develops rickets so frequently and so markedly, indicates that there are important influences to be reckoned with in addition to the food.

In considering the diet a most important question is whether the recent theory as to the vitamin origin of this disorder can be maintained and, more particularly, whether rickets should be attributed to a lack of the fat-soluble factor. We can obtain the clearest understanding of this aspect by comparing this disease to the well recognized and established deficiency diseases scurvy and beri-beri. What does the comparison show? In the first place, these two disorders are commonly accompanied by weakness and malnutrition, we do not encounter the strong, apparently healthy babies met in rickets. But of far greater moment is the fact that neither can be brought about by over-feeding. Rickets, as emphasized in the body of this paper, frequently develops in infants receiving too much milk rich in fat, protein and salts. It seems impossible to bring this fact into consonance with a deficiency disease, whatever may be its nature, using this term in the commonly accepted sense. Our

study shows that the fat-soluble vitamin is not the controlling influence, that infants develop rickets while receiving a full amount of this principle and that they do not manifest signs, although deprived of this vitamin, for many months at the most vulnerable period of their life. It is impossible to interpret the contrary conclusion which Mellinby came to as the result of his pioneer experiments on dogs or to accept the term "fat soluble vitamin" as synonymous with "antirachitic factor" as Hopkins and Chick would have us do. Clinical tests carried out with care must be recorded fully as much weight as laboratory investigations. The two methods of approach should be carried out side by side and even the most thorough study on animals must be made to harmonize before it can be accepted as holding good for man.

Finally this work seems to show that the danger to infants of a diet deficient in fat-soluble vitamin is slight provided it includes sufficient calories and otherwise is complete. They can maintain their health and vigor despite amounts of fat-soluble vitamin so small as rarely to be encountered in times of peace. In spite of the fact therefore that this vitamin is not widely distributed in nature a disorder that may be termed "fat soluble deficiency"—marasmus or xerophthalmia—is hardly to be apprehended from a clinical standpoint.

Aortitis Syphilitica

Journal of the American Medical Association
January, 1920—C F HOOVER M D

THE writer criticises an editorial in a recent number of the Journal. He expresses surprise at the statement that "It seems highly probable that in the aorta as in the central nervous system, definite lesions may be present without any symptoms whatever and it would seem that some method of diagnosing syphilitic aortitis during the pre-symptomatic period must be devised." The diagnostic signs of aortitis, he writes, were clearly described long before the Roentgen ray or the Wassermann reaction or the spirochæte was known to the medical profession.

Among the physical signs which are characteristic of this disease are first of all those due to *elongation* and *dilatation* of the aortic arch. These are visible aortic pulsation, and aortic dulness to the right of the sternum. By the time visible aortic pulsation to the right of the sternum is visible, the disease has so far advanced that it offers no difficulty in diagnosis and little hope from therapy. Slight degrees of enlargement which can be detected by percussion are of the greatest importance. Dulness in the second intercostal space on the right side compared with the left can best be detected by direct percussion with the extended finger and is an important sign of elongation and dilatation of the aorta.

Systolic pulsation of the arch of the aorta—This sign can be detected by bimanual palpation.

The examiner places his right hand over the second interspace at the right of the sternum, and his left in the interscapular space at the left of the vertebral column. By this means the muscular sense of the thoraco-scapular muscles is employed. An increase in the pulsatory expansion of the aorta can also be detected by placing the ear in contact with the second interspace to the right of the sternum.

Accentuation of the second sound of the heart affords further evidence—This phenomenon does not depend on increased intra-aortic pressure, but rather on increased accessibility of the arch due to its proximity to the anterior thoracic wall, on account of the elongation. For the same reason we get accentuation of the second sound when the aorta is pulled to the right by retraction of the upper lobe of the right lung as in fibroid phthisis.

Palpability of the diastolic impact—A palpable diastolic impact is also due to increased accessibility of the arch and may be detected by palpating with the palm of the hand at the level of the ends of the metacarpal bones.

Loss of elasticity—There is no physical sign ascribable to a loss of elasticity of the arch unless the root of the aorta is also involved. Then the diastolic sound takes on a tympanitic quality.

Murmurs—Systolic murmurs over the second right interspace depend on the production of eddies in the blood stream due to the passage of fluid from a vessel of smaller to one of larger lumen. Stenosis at the orifice and dilatation beyond supply these conditions. The loudness of the sound depends on the abruptness of the change.

Syphilitic mediastinitis—This is a common accompaniment of syphilitic disease of the aortic wall. Substernal pain, inclusive of the laryngeal nerve, paroxysmal tachypnoea, and pain on swallowing have all been observed. The only direct physical sign is a friction sound heard at the second interspace to the right of the sternum.

The writer concludes that the Wassermann reaction, *Spirochæta pallida* and the Roentgen ray have all served to confirm and illuminate the work of the great clinicians Fournier and Huchard to whom early recognition of this disease was due, when the only means at our disposal was physical examination.

Intravenous Injections of Hypertonic Glucose Soluble in Influenzal Pneumonia

Journal of the American Medical Association,
January 10th, 1920—WELLS and BLANKINSHIP

THE writers refer to the apparent helplessness of the profession in the treatment of the chief complication of influenza, *viz*, pneumonia. Seeing that glucose intravenously and otherwise had been used with success in serious diseases it occurred to them to test its efficiency in this fatal complication of influenza.

The strengths of the solutions used were 5, 10, 15 and 25 per cent. The usual intravenous technique was employed, 250 to 300 c.c. of the solution being injected in thirty to forty minutes (60 to 90 drops per minute).

In all 319 patients were treated. These were divided into three groups. Group 1 comprised those cases who were seriously ill, but who were expected to do well under the usual methods of treatment. Group 2 included those who were dangerously ill, but who had a fighting chance of recovery. Group 3 included all the hopeless cases. The mortality rates for each group were: Group 1, *, Group 2, 645, and Group 3, 6506.

The mechanism by which glucose solution aids in recovery is considered by the writers to be two-fold. In the first place there is an influence on dehydration. There is at first a withdrawal of fluids from the tissues, as shown by a fall in the hæmoglobin content of the blood and a normal sugar concentration shortly after injection. This is necessary to maintain an isotonic condition of the blood. There is no withdrawal of sugar from the blood by the kidneys, for in the writers' cases glycosuria was uniformly absent. Secondly, glucose being a food is used up by the starving tissues. Associated with this is stimulation of cell activity as pointed out by Lusk and possibly direct stimulation of the cardiac muscle.

The writers summarise their conclusions as follows —

"1 The intravenous injection of glucose solution is a valuable aid in the treatment of serious cases of pneumonia.

"2 The results following are almost immediate, but are not necessarily lasting, and success may follow only after repeated injections.

"3 The injection of glucose solution is not more difficult than the injections of other intravenous medication.

"4 It is not intended that glucose solution should be substituted for anti-pneumococcic serum in cases of type 1 infections, it may, however, be added to the serum treatment."

NOTE.—Glucose belongs to Heidenham's second class of lymphagogues and was considered by this author to act as a stimulant to the endothelial cells lining the capillaries. Starting, however, showed that the increased flow of lymph is due to a condition of hydræmic plethora caused by attraction of fluid from the lymph spaces causing increased capillary pressure, and increased filtration of fluid from the blood vessels. It is impossible that this increased flow of lymph with its resultant washing out of toxins from the tissues may account for part of the improvement.

Treatment of Goitre with Injections of Phenol, Tincture of Iodine and Glycerine.

Journal of the American Medical Association,
January 10, 1920—J. E. SHEEHAN, M.D., and
W. H. NEWCOMB, M.D.

THIS article is a report on the results of injections into the thyroid gland of equal parts

of phenol (carbolic acid), tincture of iodine and glycerine, in 80 cases of goitre.

Method—Twelve minims of a mixture of equal parts of tincture of iodine, phenol and glycerine are injected into the most prominent part of the gland. The needle is plunged directly into the gland and the patient instructed to swallow. If the needle is in the gland it will show a marked excursion during the act. If outside the gland no such movement will take place. The injection should be made very slowly to avoid severe pain. There is always some pain, but it soon subsides. The usual interval between injections is five days. The number of injections required is from five to twenty-six.

Mode of action—The rationale of the treatment is to cause localised inflammation of the gland with a resultant fibrosis. It quiets the heart's action, improves the appetite, has a favourable effect on metabolism, stays emaciation, and reduces the mental irritability. After the case has favourably reacted to treatment one is able to feel islands of fibrosis just as in hob-nail liver.

It has been the writer's custom to inject all cases for operation. The patients are kept in bed, but may be allowed up for a few hours daily. Light non-animal diet, coden in small doses and colonic irrigations are also ordered. The result of this regime is relief of toxic symptoms and a better chance of operative success. The most suitable type of case for this treatment is the parenchymatous goitre of young women. It is also useful in exophthalmic goitre but is of no avail in the cystic or colloid form.

The writer's conclusions are as follows —

1 A goodly percentage of parenchymatous goitre will be cured by this method.

2 It relieves the thyrotoxicosis in the graver forms.

3 It is of no use in the cystic and colloid forms, and never should be given.

4 It is a safe procedure if one's technic is not faulty.

5 It is given as a preliminary in all cases going to operation, with the exception of the cystic, colloid and cancerous forms.

6 It is the only hope of relief in the inoperable cases and those in which surgery is refused.

High Protein Diets and Nephritis

Journal of the American Medical Association,
January 10, 1920

COMMENTING on the connection between High Protein Diets and Nephritis, the Editor, *Journal of the American Medical Association*, writes —

"The science of pathology is still far from formulating an entirely satisfactory hypothesis for the genesis of all forms of nephritis. It is known, of course, that incident to the attempts

of the kidney to eliminate certain substances like the salts of mercury or uranium or several other metals, a tubular nephritis of varying intensity may arise, and the acute injury may subsequently become chronic in its manifestations. There is considerable justification for the belief that the retention of the secreted urine, which in turn is dependent on the nature of the food intake is not without influence on the behaviour of the kidney cells under secretory stress. Usually, however, the etiology of nephritic changes is sought in some foreign factor, such as the inorganic possibilities just cited or nephrotoxins or nephrolysis assumed to arise within the organism itself.

"Although the alleged 'strain' of eliminating a large quantity of those substances, namely, the products of protein catabolism in the body which the kidney is normally intended to excrete, has been pointed to from time to time as a possible cause of the kidney damage there has been little convincing evidence for such an outcome. Urea, which represents the great bulk of the nitrogenous waste, is evidently excreted with great ease. There are numerous recorded instances of large increments in urea output without any signs of kidney defect or detriment, but experiments to determine the functional efficiency of the kidney have usually been of comparatively short duration. The clinical forms of nephritis are frequently slow in making their appearance. Newburgh has therefore attempted, in the department of internal medicine at the University of Michigan, to ascertain whether nephritis will be produced when the kidneys have been eliminating an unusually large amount of nitrogenous material over a considerable period of time. He argues that just as the kidney secretes ordinary medicinal doses of mercury without harm but is injured when the quantity offered for elimination in a given time is augmented greatly, as it is in acute poisoning, so the renal cells may react unfavourably if the quantity of some or all of the nitrogenous substances secreted is increased and kept at the higher level for some time. In feeding experiments on rabbits, renal injury was quickly and constantly noted in animals that ate several egg whites daily. Prolonged egg white feeding caused acute and sub-acute nephritis. When the nitrogenous metabolism was increased by means of casein, rabbits suffered no demonstrable renal injury from eating 15 gm of casein daily, but when the daily intake of casein was 30 gm, and the nitrogen metabolism was about three times normal, a well marked deleterious effect on the kidney was produced. Rabbits that lived for months on soy beans, which are rich in vegetable proteins, regularly acquired chronic nephritis and frequently died of it. The nitrogen metabolism from this diet was about twice the normal.

"We may accept these observations, which are likely to be widely quoted by the advocates of a low protein diet or at least of greater economy

in the use of protein, without admitting their wider significance in the etiology of human nephritis. The vegetarians will find little solace in the fact that sources of plant proteins were involved as well as the tabued animal products. Urea *per se* is not charged with the harm done. It must be remembered that the diets used by Newburgh were potentially acid in character, and certain to produce an acid urine in a species adjusted and accustomed to secrete an alkaline fluid under a free choice of food. Until such experiments are successfully duplicated under conditions in which the normal reaction of the renal secretion is not tremendously altered and the accessory factors in the diet are known to be adequate, the incrimination of the high protein diets in connection with nephritis must be considered with judicial reserve."

Lung-Irritant Gas Poisoning and its Sequelæ.

Journal of the Royal Army Medical Corps, Dec., 1919—J S HALDANE M.D., F.R.S.

IN a lecture delivered at the Royal Army Medical College on October 8, 1919, Professor Haldane described some of his experiences and researches on the effects of the poisonous gases used by the Germans during the World War.

Dr Haldane states that the first cases he saw were produced by chlorine in a concentration of 1 in 10,000. The bad cases were panting, deeply cyanosed, with plum coloured lips, distended veins and more or less stupefied. These were the so-called "plum coloured" cases. Post mortem the lungs were voluminous and much congested. Albuminous fluid could be squeezed from them in abundance. The bronchi and alveoli were much inflamed and a great deal of emphysema was present.

A second group of cases due to phosgene and other lung irritants was met with later. In this group—the "gray" cases—the initial symptoms were sometimes delayed, the superficial veins were not distended and the lips and face were of a grayish colour.

With regard to the pathology of the first type, Dr Haldane takes us back to the physiology of breathing. He pointed out that during normal breathing the oxygen in the lung alveoli comes into diffusion equilibrium with the blood. The hæmoglobin in the arterial blood leaving the lungs is almost saturated with oxygen. To reach the blood the oxygen has to pass through the alveolar epithelium and capillary wall. In health while at rest, there is sufficient time (1 second) for diffusion equilibrium to be attained. During the muscular exertion the process may not be complete, hence the panting, cyanosis, etc., sometimes observed.

In "gassed" cases, owing to swelling, exudation, and paralysis of secretion by the alveolar epithelium (Dr Haldane believes that active secretion of oxygen inwards does take place in

cases of definite oxygen want), the oxygen cannot get through to the blood quickly enough to saturate the hæmoglobin to the normal extent.

In a similar manner the carbon dioxide is unable to leave the blood. As a result we get anoxæmia with an excess of carbon dioxide in the blood. The symptoms due to anoxæmia, *viz*, cyanosis and clouding of intelligence disappear on administration of oxygen, but the hyperpnœa which depends on excess of carbon dioxide remains.

It is evident from the frequency and fulness of the pulse, and distension of the capillaries, that the circulation is greatly increased.

To explain these phenomena Dr Haldane points out that the circulation is regulated not primarily by the action of the heart itself, but by the rate at which the tissues allow the blood to return to the heart. Krogh has recently shown that the capillaries do not simply respond passively to blood pressure, but actively contract and dilate. In the plum coloured cases the dilatation is due to diminished saturation with oxygen and increased saturation with carbon dioxide. The direct result of this capillary dilatation is an increased delivery of blood to the heart.

The fulness of the surface veins can be explained by failure of the heart to respond to the increased work thrown on it, because no organ can work properly without an adequate supply of oxygen.

How can we avert these dangers? There are two means of doing so. Firstly, by bleeding. This procedure relieves the right heart, the venous distension disappears, and the tendency to œdema of the lungs is diminished. Secondly, by administering oxygen to relieve the anoxæmia.

In the second type of poisoning due to phosgene and its congeners, there is little bronchitis and emphysema, consequently the symptoms resemble those of the uncomplicated anoxæmia of high altitudes. There is but slight hyperpnœa, but, such as there is, tends to cause alkalosis owing to increased elimination of carbon dioxide (an acid). The increase in alkali is got rid of by the kidneys and the urine may become alkaline in reaction. This condition should not be confounded with acidosis, as demonstrated by certain new tests.

Another complication here arises and this depends on the dissociation curve of oxyhæmoglobin. The less carbon dioxide in the blood the greater the affinity of hæmoglobin for oxygen, so that while it takes up this gas more readily it will part with it less readily to the tissues. Hence anoxæmia with cyanosis ("plum coloured" cases) is less dangerous than anoxæmia without cyanosis ("gray" cases).

The effects of anoxæmia are first of all nausea, headache, and general depression with more or less complete loss of memory. If a severe anoxæmia lasts for a long time the

damage to the central nervous system is such that recovery may never take place, although, as in carbon monoxide poisoning, the anoxæmia has been completely removed. The greatest danger lies in failure of the respiratory centre as evidenced by increased shallowness of the breathing and the leaden-gray colour of the lips. The main effect of anoxæmia on the heart is to diminish its capacity for work, so that anæmia of the brain, as shown by dizziness, faintness and collapse, may be caused by slight exertion. The immediate danger, however, is from the respiratory centre and the treatment is administration of oxygen. Bleeding would be useless or harmful.

On the subject of oxygen administration Dr Haldane has something very definite to say. Pure oxygen, he points out, has been shown by Lorrain Smith to have a slow irritant action on the lungs. Only a moderate percentage, therefore, should be added to the inspired air. An inhalation apparatus constructed by Messrs Siebe Gorman and Co for the Army Medical Service includes an arrangement by which oxygen is delivered only during inspiration, a reducing valve and tap to regulate the supply, and a gauge to show how long the oxygen will last.

Dr Haldane next deals with one of the most prominent sequelæ of irritant gas poisoning, *viz*, dyspnœa on exertion. This symptom was relieved to some extent by breathing air enriched by oxygen. But increased frequency of respirations and an increased pulse rate remained in spite of treatment. This is due to excessive action of the Hering-Breuer reflex. It was shown many years ago by Hering and Breuer that distension of the lungs liberates a nervous impulse which passing up to the vagus nerves terminates inspiration; while deflation in a similar manner terminates expiration. More recently Haldane and Mavrogordato have shown that the point at which the Hering-Breuer reflex fires off depends on the degree to which the centre is excited by chemical stimuli, *e.g.*, carbon dioxide. If the centre concerned is abnormally irritable the reflex will fire off at a much lesser degree of deflation or distension than normal, and the breath can be held for only a few seconds.

Douglas and Haldane have recently succeeded in reproducing periodic ("Cheyne-Stokes") breathing in perfectly normal individuals. This is done by a special concertina apparatus which controls the depth of the breathing. The sequence of events is shallow breathing, anoxæmia, disturbance of the normal stimulation of the respiratory centre by carbonic acid. This periodic breathing can be abolished by adding a little oxygen to the inspired air. Further they found that "Cheyne-Stokes" breathing is more easily produced in the recumbent posture, hence orthopnœa. But this is a digression.

Finally Dr Haldane is of opinion that the neurasthenic symptoms of chronic gas cases are due to a weakening of central control. So that various reflexes run riot, e.g. the Hering-Breuer reflex firing off at inopportune moments upsets the breathing, the accelerator or inhibitory reflex upsets the heart's action and so on.

Some Clinical Types of Abdominal Tuberculosis

British Medical Journal January 3, 1920—
K. W. MONSIEUR, M.D., F.R.C.S. (Edin.)

The writer deals with the following types—

1 *Tuberculous peritonitis associated with massive ascitation*—This is in most cases primarily a blood-borne serous infection and is favourably influenced by simple evacuation of the fluid.

2 *Tuberculosis of the ileum*—The lower end is the commonest site. The primary lesion is in the mucous membrane ulceration and necrosis of which are followed by extension to the peritoneal coat causing a local tuberculous peritonitis and a matting together of the bowel surfaces. There are two methods of dealing with this condition, viz—

- (a) Exclusion by lateral anastomosis
- (b) Resection

The choice between these depends on the local extent of the lesion and the presence or otherwise of tuberculosis elsewhere, e.g., in the lungs.

3 *Tuberculosis of the caecum and large bowel*—In this situation massive tumours are as a rule built up. The bowel wall becomes greatly thickened and infiltrated and stenosis of the bowel lumen results. Here again exclusion or resection may be practised, depending on the local extent of the lesion, general condition of the patient, and presence or absence of tuberculosis elsewhere.

4 *Tuberculosis of the rectum*—Here surgical treatment can do little except deal with emergencies such as abscess formation.

5 *Tuberculosis of mesenteric glands*—A common site for a local deposit of tubercle is the mesenteric angle between the caecum and ileum, the usual diagnosis before operation being chronic appendicitis. Enucleation or excision of a mesenteric segment with its glands together with a corresponding length of bowel.

The following suggestions are offered—

1 When tuberculous disease, either of ileum or large bowel, is associated with definite intestinal obstruction, operation is always necessary, and the choice lies between exclusion by anastomosis and excision. If the obstruction is acute exclusion by anastomosis is to be preferred, if the obstruction is sub-acute the exact local condition must decide a mass that is easily isolated is better removed.

2 When such tuberculous bowel lesions are not associated with obstruction, or with an obstruction that is chronic and capable of relief by aperient, the advisability of operation will depend on whether the bowel disease is or is not the sole demonstrable lesion in the body. If the lung is also affected it will be probably wiser to decide against operation.

3 With regard to disease of the rectum I know of no actual evidence that a remedy is to be found in the establishment of an artificial anus. This has been recommended and practised on the ground that keeping the rectum empty affords a better prospect of resistance and recovery. I know at any rate of one instance in which this procedure added to the patient's discomfort without obvious benefit to the rectal condition. Before recommending this method of treatment we should require a body of evidence that cure of the rectal disease can really be anticipated in a fair proportion of cases. When the rectum is affected above the peritoneal reflection, and is associated with abscess, evacuation of the abscess by the intra-peritoneal route is to be recommended, but except for the treatment of this complication operation has no service to offer.

4 Lastly in selected cases, operation gives good results in limited tuberculous disease of mesenteric glands. According to the extent and stage of the focus this will take the form either of enucleation or of excision of the mesentery involved together with associated bowel.

Flying and "Air Sickness"

AN interesting lecture was delivered recently at a meeting of the Royal Aeronautical Society by Dr C. A. Swan, followed by a discussion.

Dr Swan emphasised the importance of the subject in view of the rapid approach of commercial aviation and increasing passenger transport. He purposely adopted the popular rather than the purely scientific standpoint, and gave an account of his personal experiences in the rarefied atmosphere of mountain altitudes. The physical and psychological factors appear to be considerably intermingled, the material effects of a low atmospheric pressure are frequently accentuated by emotional disturbances. It seems that there is a definite altitude at which each individual's compensating mechanism begins to feel the strain and individual capacity for readjustment is of greater importance than moderate changes in the environment. Muscular effort naturally increases symptoms of distress, which are variously exhibited as dyspnoea, cyanosis, vertigo, headache, tinnitus, vomiting, fainting, mental excitement, etc.

Simple remedies, such as black coffee, salol and the old guide's remedy of oil of cinnamon on sugar, frequently effect relief whilst the influence of posture is usually marked. The digestive organs and the higher nerve centres play a very large part.

Two types of altitude sickness have been described by Dr Ravenhill: an acute form and a slow form, in which compensation is gradually lost. In the latter, cardiac or nervous symptoms may predominate. Compensation is attained by rise of blood pressure and by hyperpnœa, both of which may be ascribed to a response of the medullary centres to lack of oxygen and psychical influences. In acclimatisation the

acidity of the blood due to non-volatile acids is increased, so that the respiratory centre becomes properly excited, although the alveolar carbon dioxide tension is low, in those who habitually dwell in mountain altitudes the red blood corpuscles are actually increased.

Dr Swan observed that "staleness" in pilots is essentially due to fatigue of the mechanism for acclimatisation, and that rest is the first obvious point in treatment. Other causes of fatigue, such as eye-strain, dental sepsis, blocked nostrils, and mental worry should be eliminated as far as possible. But the pilot flying under war conditions, driving a fast-climbing machine and repeatedly encountering alarming evidence of "hate," presents a very different problem from those who fly in civil life, although a remarkable proportion of war pilots came to grief through influence of altitude whilst many flew successfully who, by all the rules of the game, should have been unfit for aviation in any circumstances.

In the discussion following Dr Swan's address, General Brooke Popham laid stress on the importance of oxygen administration, and said that great benefit was derived from its use in France during the war. Dr Stamm considered that the question of air-sickness will affect airship rather than aeroplane flying, and that the provision of oxygen affords no real difficulty. The chairman, Brigadier-General Bagnall Wild, attaches importance to a healthy digestion, and expressed the opinion that there need be no fear of suffering during passenger flights apart from excessive altitudes (over 15,000 feet) and "stunting."

Aviation as a means of transport would appear to present no serious terrors in this direction to the healthy individual. Our systems are far more adaptable than we are too often encouraged to believe—*The Hospital*

Castellani's Hæmorrhagic Bronchitis.

J BENECH (*Rev méd de l'Est*, November 1st, 1919) gives the following description of this form of exotic bronchitis, which has been introduced into France since the war, and often simulates tuberculosis. The incubation period is only one or two days. The onset is characterized by tracheo-bronchial pain, followed by muco-purulent expectoration, which is sometimes accompanied by headache and pains in the limbs and often by fever of a few days' duration, ranging from 100.4 degrees to 104 degrees. At the height of the disease the cough becomes less hoarse and the sputum assumes its characteristic appearance. The expectoration is at first slight homogeneous, being constituted by muco-purulent sputum streaked with blood or by a definite viscous hæmoptysis. But the most striking feature is the subsequent hæmolysis of the sputum. The fluid portion becomes pink coloured, while the muco-purulent part turns white and becomes adherent to the wall of the spitting cup or floats in the hæmolytic fluid. The physical signs are those of ordinary bronchitis, with occasional evidence of consolidation at the apices or congestion at the bases. The general condition usually remains fairly good. As a rule the expectoration becomes muco-purulent at the end of three or four weeks and then dries up. The physical signs completely disappear and the patient usually recovers without a relapse. Four varieties of the disease have been described: (1) An acute form, as above, (2) a relapsing form, in which the effect on the general condition is more marked, (3) a chronic form, which may last for years and then assume a rapid and malignant course, (4) associated and complicated forms, which include cases complicated by pneumonia, broncho-pneumonia, tuberculosis, and pulmonary mycosis. On bacteriological examination of the sputum the *Spirochaeta bronchialis*, which is the causal agent of the condition, is found in enormous numbers. The prognosis is generally favourable. The most serious event is for the

disease to become chronic, as this often gives rise to a serious general condition and favours the development of intercurrent pulmonary disease. There is no specific treatment, but Castellani recommends antimony tartrate as the only drug which appears to have a definite action on the hæmorrhagic process—*British Medical Journal*, December 20, 1919.

At the annual meeting of the Société de Pathologie Exotique, held on 10th December, 1919, Lieutenant-Colonels Sir Leonard Rogers and C. Donovan were elected Associate Members of the society. We heartily congratulate them on the honour thus bestowed on them.

LT COL. SIR W. J. BUCHANAN SCHOLARSHIP FUND ACCOUNT.

			Rs.	A	P
1919					
March	26	Lt Col W D Sutherland, I.M.S.	100	0	0
	27	Lt. Col A Leventon, I.M.S.	150	0	0
	27	Lt. Col D Green, I.M.S.	150	0	0
April	1	Lt. Col W R Newman, C.I.F., I.M.S.	100	0	0
	2	Lt Col J T Calvert C.I.E., I.M.S.	150	0	0
	10	The Hon Major Genl W R Edwards C.B., C.M.G. I.M.S.	200	0	0
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	28	Lt. Col W B Lane, I.M.S.	100	0	0
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Nov	1	Lt-Col Sir Leonard Rogers, C.I.E., I.M.S.	150	0	0
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1920					
March	19	The Hon Major Genl. W. R. B. Robinson, C.B., I.M.S.	200	0	0
	19	Lt Col A G Coullie, I.M.S.	75	0	0
		Lt-Col D M McCoy, I.M.S.	500	0	0
		Proprietors, <i>Indian Medical Gazette</i>	500	0	0
		A R Murray, Esq., C.B.E.	100	0	0
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		W Kirkpatrick, Esq.	175	0	0
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X-Rays in the Treatment of Tuberculous Adenitis.

The British Medical Journal, December 20, 1919

DR FRANCIS HERNAMAN-JOHNSON writes —

I was interested to read in the *British Medical Journal*, of November 29, an article by Mr E S Molyneux on the use of radium in tuberculous glands of the neck.

The results of unaided surgery in such cases can hardly be considered good, recently I came across a case on which fourteen operations had been performed within six years, and a fifteenth was in contemplation. This may be an exception, but half a dozen operations are quite usual, and the cosmetic results leave much to be desired.

The effects of treatment by radium on early cases are no doubt excellent but the point I wish to make here is that eminently satisfactory results may be attained by X rays which are, as a rule more readily available than radium. While X-ray treatment alone will cure the very early case, it is, in my experience, usually desirable to call in a surgeon when all the periglandular inflammation has subsided, and the glands can only be detected on careful palpation. An operation at this stage—which is usually reached after about six to eight weeks of X-ray therapy—is a very simple matter and the scar should be practically invisible. If the operation be not done a considerable number of apparent cures will relapse and do not a second time yield so easily to treatment. Pre-operative treatment, if given with proper dosage and filtration does not in any way unfit the skin to withstand surgical trauma.

A case in which softening is already present should be dealt with at once surgically, but should be treated by X rays very soon after the operation. If this is done discharging sinuses will heal in a few weeks instead of taking months as is sometimes the case if they are left to themselves.

Reviews.

ON GUNSHOT INJURY TO THE BLOOD VESSELS.—By SIR GEORGE HENRY MALES COME CB FRCR. Bristol: Wright and Sons, Ltd. 1919. Super roy. 8vo. Pp. xi + 251. 60 figs. 4 plates. 21/- nett.

THE experiences of the Great War have added vastly to our surgical knowledge and this applies especially to injuries of blood vessels. The author of "Gunshot Injuries to the Blood Vessels" makes no attempt to deal with the literature of the subject but he gives us a first-hand account of the surgery of vascular injuries, on which he is an admitted authority.

The subject is first dealt with generally and compared with the findings of other campaigns, anatomical considerations, symptoms and signs of the various types of injury and the problems of treatment are fully discussed. In the final chapters special points in connection with the individual vascular lesions are gone into.

The book should be read by every surgeon, because it is important that all should realize that many of the statements laid down in pre-war text books will now require wholesale revision. As an example of this, the teaching with regard to ligation of a main artery may be mentioned. Ample proof is brought forward that ligation of both artery and vein for the arrest of hæmorrhage is a safer proceeding than ligation of the artery alone. One cannot but feel sympathy for the restless spirits of those who in past generations were "referred" in operative surgery examinations for tying both artery and vein!

DISEASES OF THE SKIN.—By RICHARD L. SUTTON, M.D. 910 illustrations and 11 coloured plates. 3rd edition, revised and enlarged. London. 1919. Henry Kimpton. Price 42s nett.

THIS work is now in its third edition, which proves that it is of use to the medical profession, as indeed it could not fail to be, for it is

by far the best illustrated treatise on dermatology that we know of. It is also a reliable guide to treatment. Need we say more?

SYPHILIS. A TREATISE ON ETIOLOGY, PATHOLOGY, DIAGNOSIS, PROGNOSIS, PROPHYLAXIS AND TREATMENT.—By HENRY H. HAZEN, A.B., M.D. With 160 illustrations, including 16 figs in colours. London. 1919. Henry Kimpton. Price 36s nett.

THIS is another of the beautifully illustrated works published by Mr Henry Kimpton, whose perusal amply repays the reader. The author has had the various sections written by acknowledged authorities, and added thereto his own ripe knowledge of the subject, with the result that we have here an authoritative work, which many a practitioner will find to be a very present help in time of trouble.

We note that due prominence is given to the blighting influence exercised, albeit *bonâ fide*, by John Hunter on the study of the nervous manifestations of the disease, which he asserted did not exist, although older observers had carefully noted their occurrence. We do not agree with Nonne that extra genital chancres are no more dangerous in leading to nervous complications than genital chancres for we believe that all chancres that lie above the line of the lower jaw are more apt to cause serious cerebral involvement than those at any lower site. But we heartily agree with the dictum that the later in the disease the symptoms of cerebral involvement occur the worse the prognosis as a rule, and we would add that in cases of chancre of the mouth, etc., the symptoms are prone to appear early and to be very severe. It is good to read that whenever we know that a middle-aged person has syphilis we should be on the look-out for signs of general paresis in his case, and, dismissing from our minds the picture of the grandiose, exalted parietic, concentrate our attention on minor points, such as alteration in his habits, *plus* the four cardinal signs—defects of speech, abnormal knee-jerk, Romberg's sign and the Argyll-Robertson pupil.

The discovery made by Dr Reasoner that soap almost instantly kills the *treponema pallidum* is insisted upon, and ought to be more widely known than it is for unquestionably the future of the human race depends greatly on the measures that are now taken to prevent the spread of syphilis.

As medical men we are more concerned with public health than with morals. As citizens we ought to realise that, since at least 20 per cent of all cases of syphilitic infection take place "innocently," it is foolish to argue that by recommending the use of the condom or Metchnikoff's ointment we are "condoning immorality." Even the legal mind has evolved the maxim that it is better that a criminal should escape than that an innocent man should suffer.

When the rest of the world has attained to the level of common sense reached by the State

of Western Australia, and enacted similar laws, the control of syphilis will be easy. But not till then.

The methods of treatment described will be found efficacious, but we think that the author has taken too gloomy a view of the likelihood of cure.

AIDS TO OPHTHALMOLOGY—By N. BISHOP HARMAN, M.A., M.B. (Cantab.), F.R.C.S. Sixth edition. Size Fcap 8vo. Pp 226. Figures in text 112. London: Baillière, Tindall and Cox. Price 3s 6d nett.

It is unnecessary to say much about this well-known series of publications. The sixth edition has been carefully revised and brought up to date. New illustrations have been added. In fact the present volume retains all the good points of last edition and the weak points have been strengthened. While by no means pretending to be a complete exposition of the subject, this little book should prove specially useful to the student working for examinations, and to the general practitioner who has little time to devote to special branches of his profession such as ophthalmology.

A TEXT BOOK OF SURGERY—By W. Q. WOOD, M.D., F.R.C.S. (Edin). Pp 554. Edinburgh: James Gal- loway. Price 15s nett.

The author states that the object of this volume is to provide the student with a text book which he can conveniently read in connection with a course of lectures on surgery. As pointed out, the student has no time to read the majority of text-books on surgery and requires help to keep in touch with lectures. Viewed from this standpoint the present volume should meet with universal approval.

A special feature is the sub-division of the various subjects into sections under the headings: Etiology, Pathology, Clinical features, and treatment.

The advisability of omitting illustrations may be questioned. It will be generally admitted, however, that illustrations, unless of a high grade, are worse than useless. The general "get up" and avowed object of this volume are such as to render the inclusion of first-class illustrations improbable, at any rate without greatly increasing the size and expense of the book and thereby diminishing its utility.

On the whole we may congratulate the author on having produced a useful and readily accessible introduction to surgery for the student.

ROENTGEN INTERPRETATION. A MANUAL FOR STUDENTS AND PRACTITIONERS—By GEORGE W. HOLMES, M.D., and HOWARD E. RUGGLES, M.D. 205 pages, illustrated with 181 engravings. London: Henry Kimpton.

THIS little volume supplies a want which has long been felt by students and practitioners. In the average book on X-ray the question of Roentgen Interpretation is obscured and relegated to a back seat by the mass of technical details. In the volume under review only such technical details are given as are necessary for the proper understanding of the "shadow-graph."

The whole range of medicine and surgery is covered and practically all the important conditions are illustrated by skiagrams excellently reproduced.

The authors are to be congratulated on having produced a volume of real utility to the radiologist, physician and surgeon.

X-RAY OBSERVATIONS FOR FOREIGN BODIES AND THEIR LOCALISATIONS—By CAPTAIN H. C. GAGE, R.C.O.P. Consulting Radiographer to the American Red Cross Hospital of Paris. London: William Heinemann, Ltd. Pp 83. Price 6s nett.

THIS little volume, which was to have been a chapter on the localisation of foreign bodies in a work that was being compiled for the American Council of National Defence, presents in a small compass the theory and practice of the most modern and accepted methods of localisation of foreign bodies. It is the product of four years' experience under war conditions and unique opportunities in the study of localisation of missiles of various kinds.

The book is profusely illustrated with photographs, skiagrams and drawings. The type is bold and clear. It includes a description of such aids to extraction as the telephone probe, the Bergonie Vibrator, etc., and, therefore, may be perused with profit, not only by the radiologist, but also by the operating surgeon.

OTO-RHINO-LARYNGOLOGY FOR THE STUDENT AND PRACTITIONER By DR. GEORGES LAURENS.

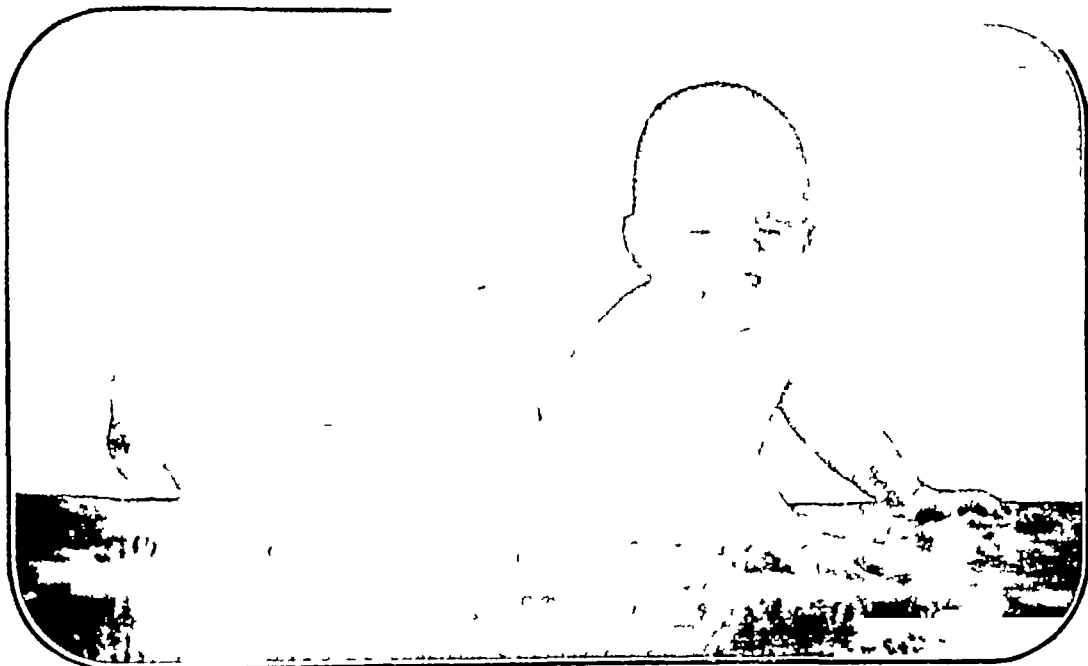
THIS small volume, running to about 320 pages, is the English translation, by Dr H. Clayton Fox, of the second French edition of Dr Georges Laurens' work. We have read the book with great pleasure and much profit, and have nothing but praise for it. From beginning to end it is crammed full of sound practical instruction and explains with great preciseness and clearness innumerable little points that are essential to success when dealing with these special sense organs. The book covers a wonderfully wide field, is attractively written and contains no less than 592 helpful illustrations. We know of no book that compares with it for general usefulness and can confidently recommend it to the general practitioner, for whom it is chiefly intended, and to the specialist alike.

IN the review of Lieut-Col O'Meara's *Medical Guide for India*, which appeared in the GAZETTE for April, the name of the publishers—Messrs Butterworth and Co (India), Ltd—and the price—Rs 12—were, by an oversight, not mentioned.

Correspondence.

To the Editor of THE INDIAN MEDICAL GAZETTE

SIR,—Workers in the field of vaccine lymph production will, I am sure, be very grateful to Colonel Entrican,



BABY SELMAN

Reared from birth on Virol.

Kamptee, Central Provinces, India.

25th February, 1916

DEAR SIRs,—I have much pleasure in sending you a photograph of one of my children, both of whom were reared from birth on "VIROL." My children are very big and bonny and everyone asks me "What do you give them?" so that we are constantly recommending Virol, and several of our friends are using it with excellent results

Kindly make whatever use you like of the letters and photos we have sent you, and believe us your grateful and staunch supporters.
—Yours faithfully,

(Signed) B B SELMAN

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IMS for his very interesting report of the work carried out at the Vaccine Depot Meiktila (see your issue of March 1920)

I agree with him in the desire he expresses for more interchange of ideas among those engaged in the difficult and responsible work of producing a pure vaccine lymph which will withstand the very adverse conditions of a tropical climate. Papers such as he has favoured us with are a great help and I am sure many, like myself would welcome a more detailed account of the methods in use at Meiktila.

I may be allowed however to draw the attention of your readers to certain facts which may be of interest in view of statements made by Colonel Intricau in his paper.

The Vaccine Institute, Pélraum issued during the year 1918-19 a total of 1,06,620 doses of vaccine lymph. All lymph was purified by the chloroform process and examined bacteriologically before issue. The ease and efficiency of process returned from the Presidency Districts to whom 520,340 doses of lymph were issued was 99.68 and 97.64 respectively. Vaccination is carried on in all the districts of the Presidency and Sind the whole year round. The high temperatures recorded in Sind during the hot season are notorious and many vaccinators in Sind outlying districts do not receive their lymph packets until from 9 to 10 days from the time they are despatched from Pélraum.

I would like to point out in connection with these results that the system of verification in the case of the work of Bombay Presidency vaccinators is very efficient. There are five Deputy Sanitary Commissioners on tour in the districts during the year who exercise a strict supervision over the work of the vaccinating staff.

Many methods having for object the removal from lymph of extraneous microorganisms without injury to the vitality of the essential virus have been tried at this Institute. Mixing with 50 per cent pure glycerine and distilled water and subsequent passage of chloroform vapour carefully controlled by bacteriological tests has proved most satisfactory and has withstood the test of experience covering over ten years' work. Colonel Intricau I am sure will forgive me if I express surprise at his wholesale condemnation of chloroform.

Thanking you in anticipation for publishing this letter

Yours etc.

R. W. FISHER M.B. DPH,
Director

VACCINE INSTITUTE

PÉLRAUM 27th March 1920

MR. KRISHNAVAL J. DHOLAKIA L.M.S., Bhuj, writes to ask whether the pityriasis versicolor which he has so often met with in phthisical patients has any bacteriological affinity with phthisis.—No pityriasis versicolor is due to the microsporon furfur a mould. We should much like to have photographs of the cases in which this condition has been seen by our correspondent on the lower part of the face for this is an uncommon site.—Ed J. M. G.

Service Notes.

LIEUT-COLONEL B. H. DEARE M.R.C.P. DPH, IMS, Officiating Principal and Professor of Medicine, Medical College Calcutta, and First Physician to the College Hospitals, is confirmed in that appointment, with effect from the 6th October, 1919.

LIEUT-COLONEL D. McCAY, M.D., IMS, Officiating Professor of Clinical Medicine and Materia Medica, Medi-

cal College and 2nd Physician to the College Hospitals, is confirmed in that appointment with effect from the 6th October, 1919.

MAJOR J. A. SHORTEY, M.B. IMS, Officiating Professor of Physiology, Medical College, Calcutta is appointed substantively *pro tempore* in that appointment, with effect from the 6th October 1919.

TEMPORARY COLONEL F. A. F. BARNADO C.B.E. C.I.E. M.B. F.R.C.S.E. IMS, is appointed to be Civil Surgeon Simla (East), with effect from the forenoon of the 15th March 1920.

LIEUT. COLONEL SIR LEONARD ROGERS Kt. C.I.E. F.R.S. M.D. F.R.C.P. F.R.C.S. IMS Professor of Pathology, Medical College Calcutta, is granted with effect from the 1st March 1920 combined leave for 12 months *vis.* privilege leave for six months and in continuation furlough for six months.

MAJOR R. KNOWLES, IMS, Director of the Pasteur Institute and Clinical Research Laboratory Shillong is appointed to officiate as Professor of Pathology, Medical College Calcutta *vice* Sir Leonard Rogers with effect from the 1st March 1920 until further orders.

LIEUT. COLONEL R. F. STANDAGE Indian Medical Service (Bombay) an Agency Surgeon is granted privilege leave for five months and twenty days with effect from the 10th March 1920 or the subsequent date on which he avails himself of the leave.

MAJOR E. C. C. MAUNSELL Indian Medical Service, Staff Surgeon, Bangalore, is appointed to officiate as an Agency Surgeon and as Residency Surgeon Mysore, in addition to his own duties during the absence on privilege leave of Lieut-Colonel R. F. Standage, Indian Medical Service.

THE following acting promotion is notified, subject to His Majesty's approval—

Temporary Captain V. N. AGATE Indian Medical Service (Temporary Commission) to be acting Lieut-Colonel while commanding a Combined Field Ambulance, from the 20th June 1919, to the 31st October, 1919.

THE grant of the honorary temporary rank of Major to the officers mentioned in the Army Department Notification No. 1002 dated the 17th May, 1918 was only operative for so long as those officers were employed at the Lady Hardinge War Hospital, Bombay.

INDIAN DEFENCE FORCE.

Medical Corps

SUBJECT to His Majesty's approval, Surgeon-Lieut-Colonel Ernest Edward Francis late Assam-Bengal Railway Rifles to be Lieut-Colonel. Dated 1st April, 1917.

SUBJECT to His Majesty's approval, the services of the undermentioned officers are dispensed with, being no longer required, with effect from the 18th January, 1920.

Temporary Lieut. Yaquib Beg
Temporary Lieut. Kanai Lal Bose.

LIEUT-COLONEL R. A. NEEDHAM, C.I.E. D.S.O., IMS, Deputy Director-General Indian Medical Service, is granted with effect from the 19th March, 1920 or any subsequent date on which he avails himself of it, combined leave for 8 months *vis.* privilege leave for 6 months and in continuation furlough on average salary for two months.

MAJOR K. G. GHARPUREY, IMS, on reversion from the Military Department, was placed on general duty at the Sassoon Hospitals, Poona, from the 21st January, 1920, to the 26th January, 1920, both days inclusive

THE services of Major S. W. Jones, OBE, IMS, are placed permanently at the disposal of the Government of Bombay

IN exercise of the powers conferred by clause (b) of sub-section (1) of section 4 and section 10 of the United Provinces Medical Act (III of 1917), the Local Government is pleased to nominate Lieut-Col A. W. R. Cochran, MB, FRCS, IMS, to be a member of the United Provinces Medical Council, *vice* Lieut-Col G. T. Birdwood, IMS, resigned

CIVIL SURGEON LIEUT-COLONEL R. H. MADDOX, CIE, IMS, made over charge of the Arrah Jail to Officiating Civil Surgeon Babu Rajeshwar Prasad on the afternoon of the 25th February, 1920

CIVIL SURGEON LIEUT-COLONEL B. R. CHATTERTON, IMS, made over charge of the Hazratibagh Central Jail to Civil Surgeon Lieut-Colonel R. H. Maddox, CIE, IMS, on the afternoon of the 29th February, 1920

THE names of the undermentioned Officers, Warrant Officers Non-Commissioned Officers and Men have been brought to the notice of the Secretary of State for War in accordance with the terms of Army Order 193 of 1919, for valuable services rendered whilst prisoners of war or interned. Dated 5th May, 1919 —

Lieut-Col E. F. E. Bunes, IMS
Capt R. C. Clifford, DSO, MC, IMS

INDIAN MEDICAL SERVICE

Captains to be temp Majors

J. R. D. Webb 25th February, 1918
R. B. Nicholson 12th March 1918
W. R. Stewart 23rd May, 1918

Temp Lieutenant to be temp Captain

Edward Nissim 6th August, 1919

THE following acting promotion is notified, subject to His Majesty's approval —

Lieut-Colonel A. M. Fleming, Indian Medical Service, to be acting Colonel while holding an appointment as Assistant Director of Medical Services. Dated 17th August, 1919

SUBJECT to His Majesty's approval the services of temporary Captain Narayan Keshinath Desai are dispensed with, on account of physical disability, with effect from the 8th January, 1920

THE date of the grant of the temporary honorary rank of Captain to Raj Kishore Kacker is the 23rd August, 1919, and not as stated in Army Department Notification No 2632, dated the 15th August, 1919

LIEUT-COLONEL D. McCAY, MD, IMS, officiating Professor of Materia Medica and Clinical Medicine, Medical College, Calcutta, and Second Physician, Medical College Hospitals, is granted, with effect from the 15th March, 1920, or any subsequent date he avails himself of it, combined leave for eight months, *vis*, privilege leave for 5 months and 13 days under article 260 of the Civil Service Regulations, and the Government of India, Finance Department letter No 168-C S R, dated the 24th February, 1919, and thereafter furlough under article 308 (b) of the Civil Service Regulations and the

Government of India Resolutions No 1514-C S R, dated the 29th December, 1919

MAJOR J. D. SANDES, MB, IMS, Surgeon to His Excellency the Governor of Bengal, is appointed to officiate as Professor of Materia Medica and Clinical Medicine, Medical College, Calcutta and Second Physician, Medical College Hospitals, during the absence on leave of Lieut-Colonel McCay, MD, IMS, until further orders

THE following officers of the IMS are permitted, subject to His Majesty's approval, to resign their Commissions —

1 Temp Capt Leonard John Panillett Mordaunt, with effect from 31st December, 1919

2 Temp Capt Piyara Lal Tandan, with effect from 21st January, 1920

THE promotion to the rank of Captain of the undermentioned officers is antedated to the 30th March, 1915, but will not carry pay before the 1st September, 1916 —

John Dykes Wilson, MB (since deceased), Laurence Allfrey Pelham Anderson, William Calder Paton, MC, MB (Brevet Major), James Bennett Hance, MB; Stephen Gordon, MC, Harold Kirkby Rowntree, MC, MB, Graham Yalden Thomson, MB, Basil Franklin Eminson, MB, Anthony Kennedy, Sorab Dhunjabhoy Ratnagar (since deceased), Colin McIver, Jordan Constantine John, OBE, MB, Richard Reginald Matland Porter, MC, MB, Robert Sweet, DSO, MB (temp Major), Edward Calvert, MB, John Robert Douglas Webb, OBE (temp Major), Francis Phelan, Archibald Campbell Macrae, MB, Navin Chand Kapur, Arthur Hilary Clifton Hill, Joseph Francis Holmes, Narayan Krishna Bai, MC, Haji Sulaiman Gulam-Hossein Haji, MC, Saheb Singh Sokhey, MB, Atul Krishna Sinha, MB (since deceased), Subramania Doraisamy, Allan Seddon, MB, James Findlay, MB, William Collins Spackman, MB, Jyotish Chandra De, MB, Nanulal Maganlal Mehta, Robert Morrison Easton, MB, Charles Henry Powell Allen, Reginald Victor Martin, George Henry Mahony, MB (acting Lieut-Col), Gordon Covell, MB, William Ross Stewart, MB (Brevet Major), Kotyvenkata Ramnar Rao, John Gregory Owen Moses, MB, Hari Chand, MC, Venkatasubba Mahadevan, Alured Charles Lowther O'Shee Bilderbeck, MB, Jacob William Van Reenen, MB, Basil Fraser Beatson, Maurice James Roche, MC, MB (since placed on the permanent half-pay list), Neehal Das Puri, MB, Prabodh Chandra Roy, MB, Monindranath Das, MC, Jagannath Balkrishna Vaidya, Joseph Martin Reeves Hennessy, Alfred Glen Cowper, William Mawhood Lupton, Hubert Horan Brown, Charles Henry Neil Baker, MC, John Walter Pigeon, Maurice Lawrence Treston, Peter Vieyra, MB, Bhamini Mohan Mitra, Philip Savage, Amir Chand, MB, Robert Lee, MB, Nilkanth Shriram Jitir DSO, Tadepally Sankara Sastry, MB, Jamal-ud-din, MB, Ferozeshah Bapuji Chenoy (since deceased), Sadanata Bashiam Venugopal, Charles deCarteret Martin, MB, Joseph Henry Smith, MB

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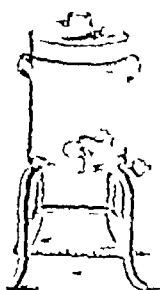
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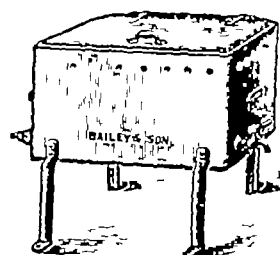
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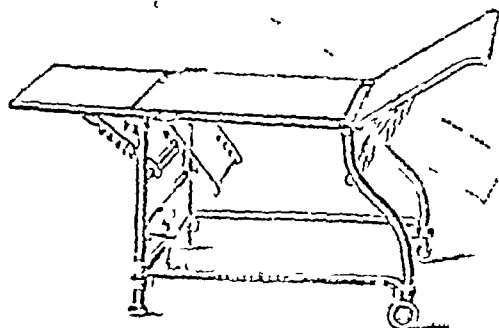


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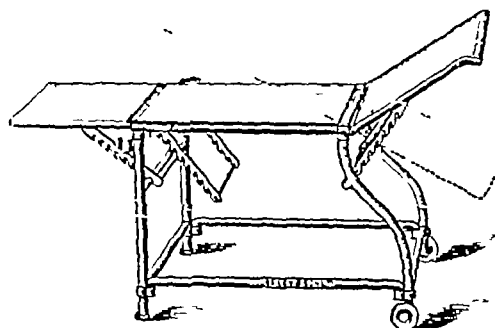


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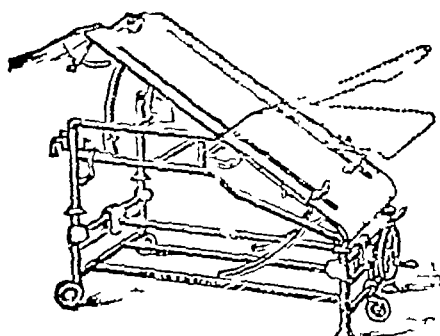
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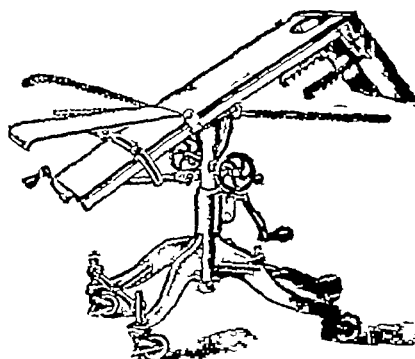
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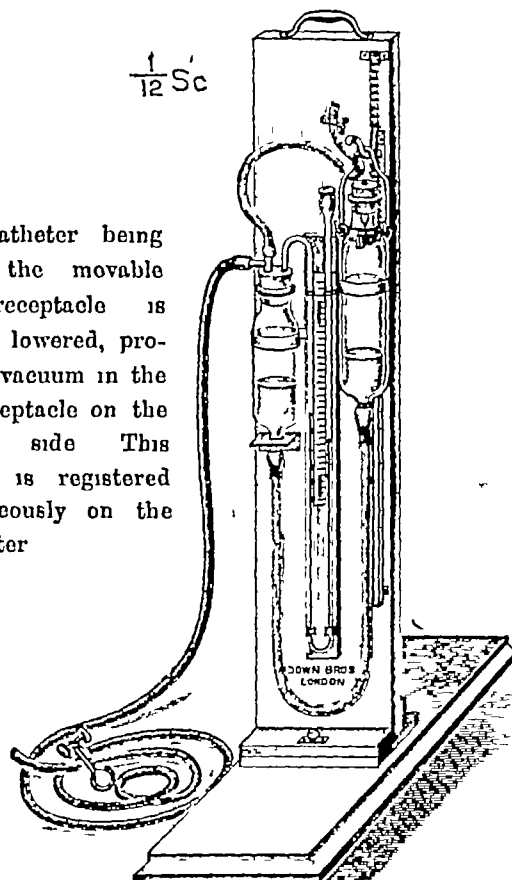
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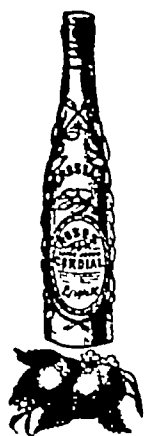
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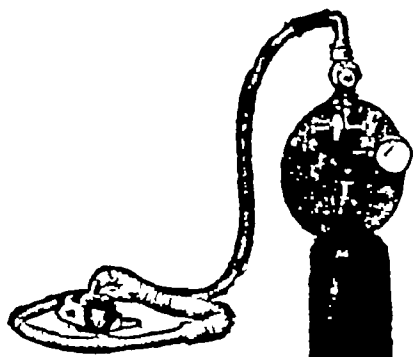
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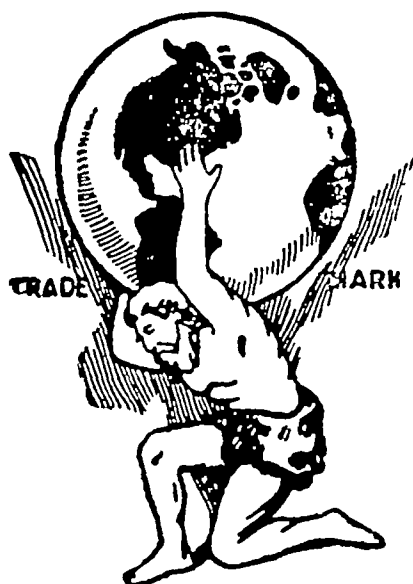
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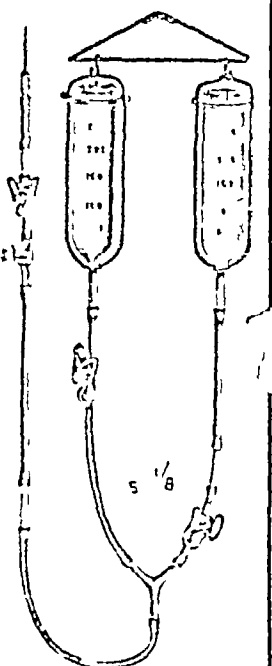
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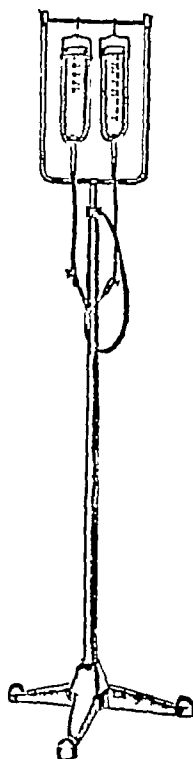
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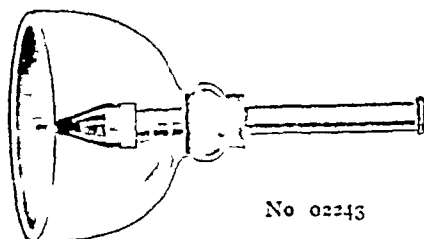


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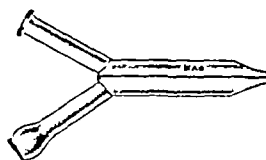
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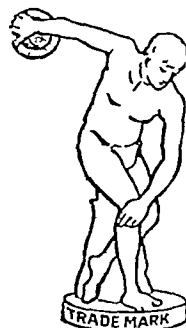
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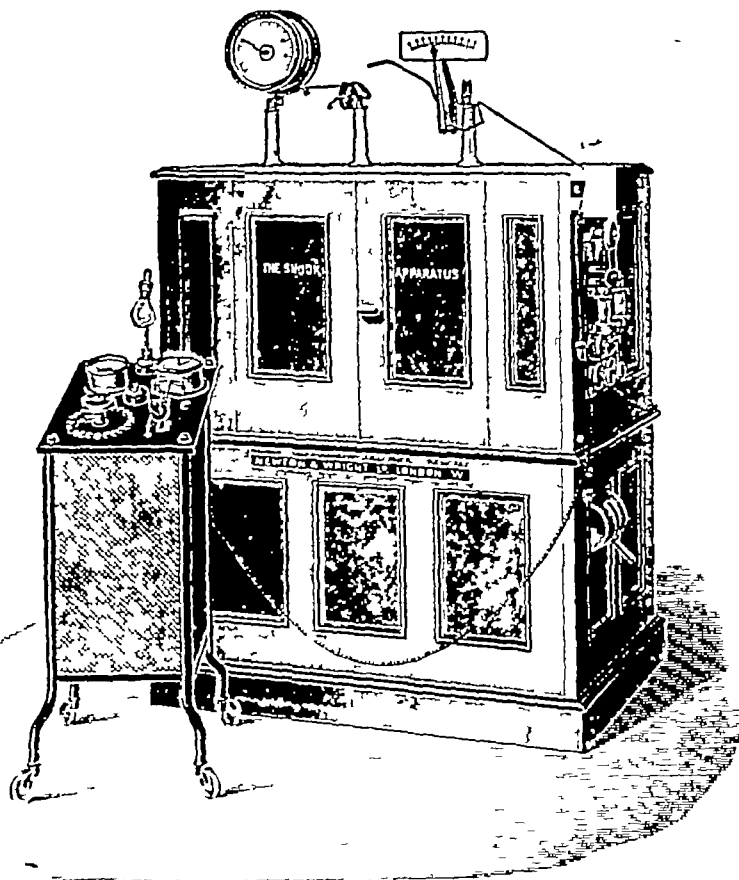


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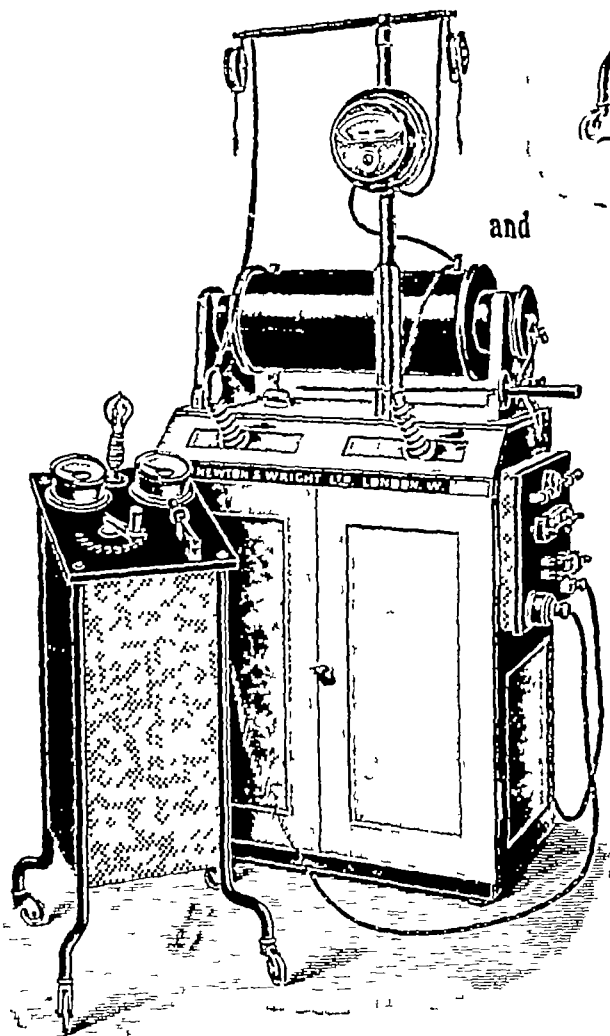


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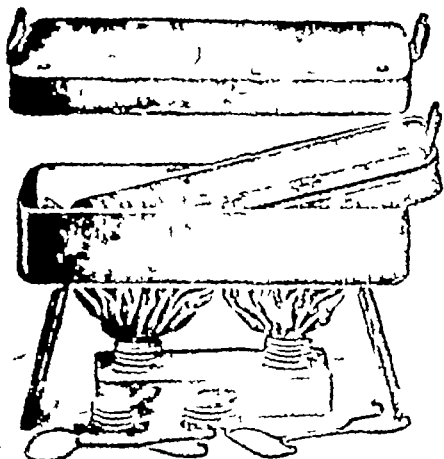


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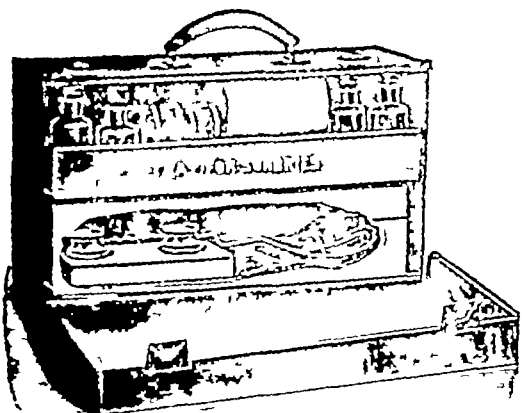


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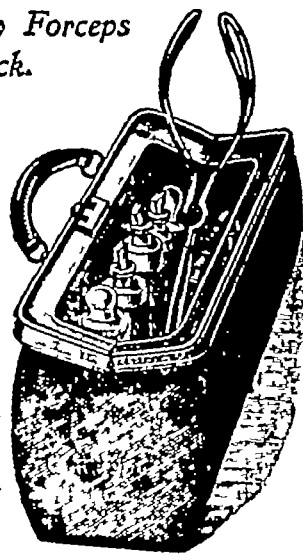


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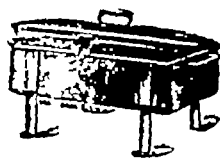


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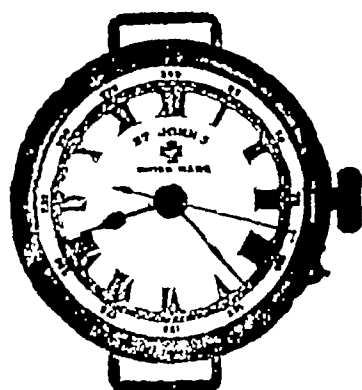
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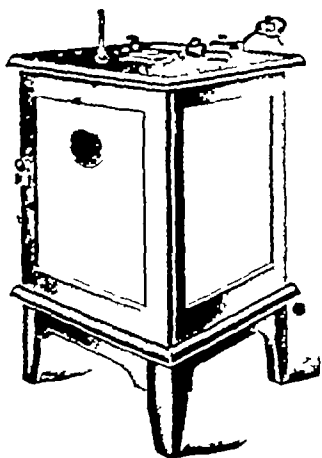
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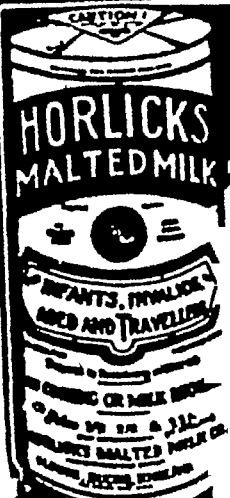
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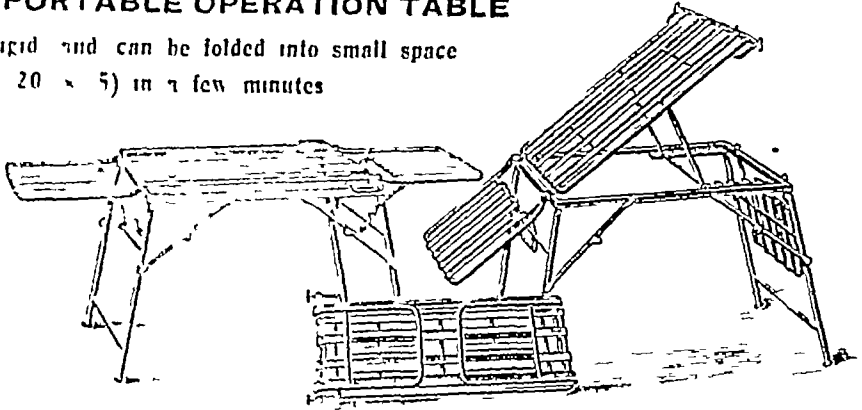
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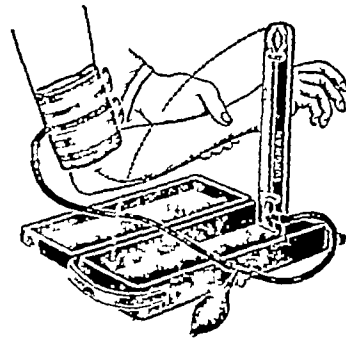
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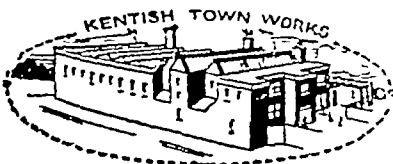
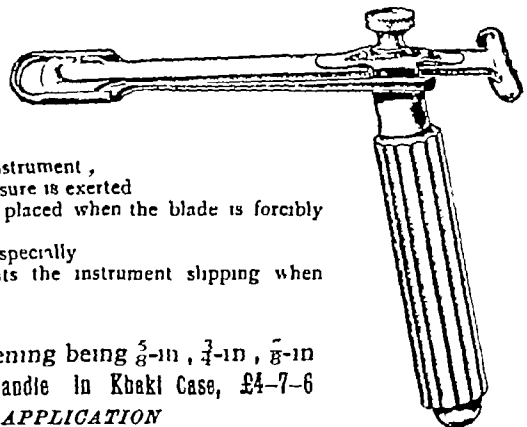
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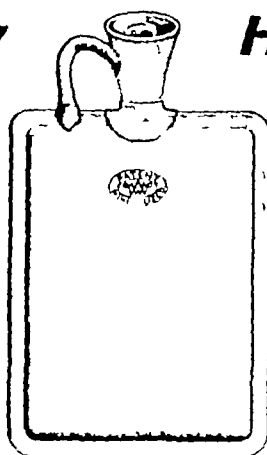
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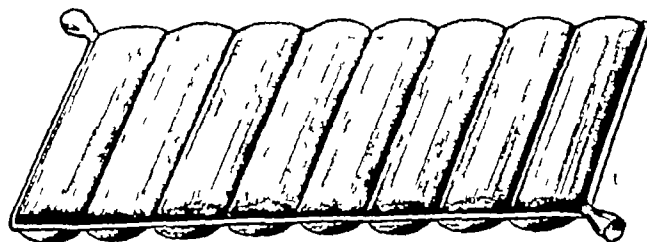
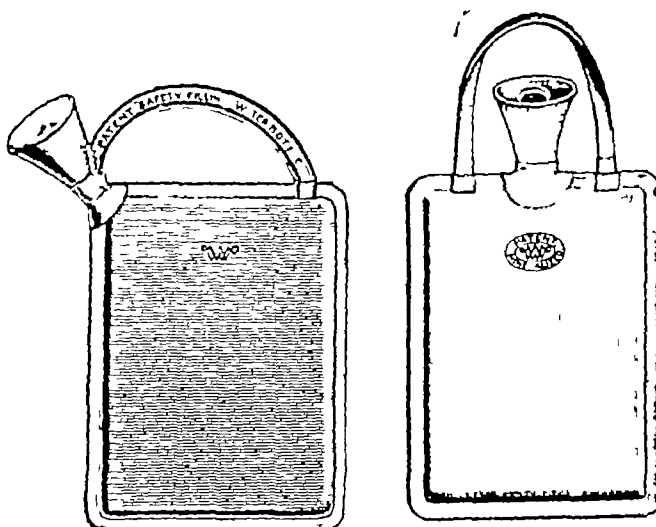
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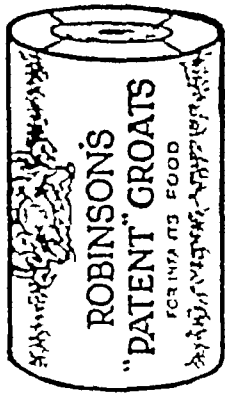
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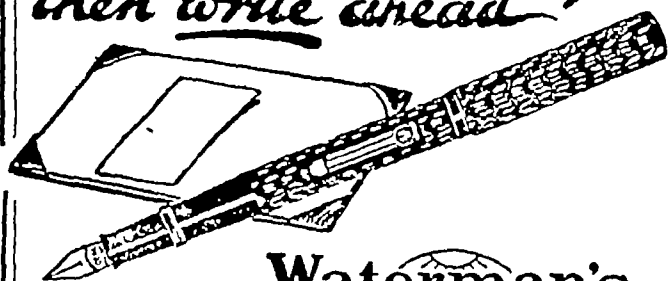
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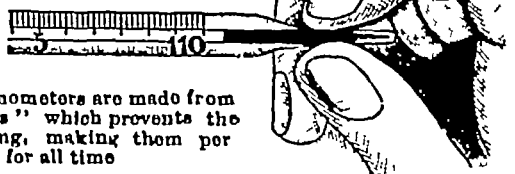
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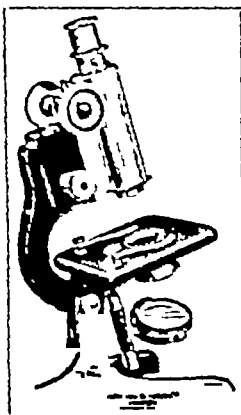
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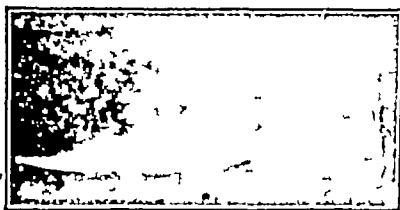
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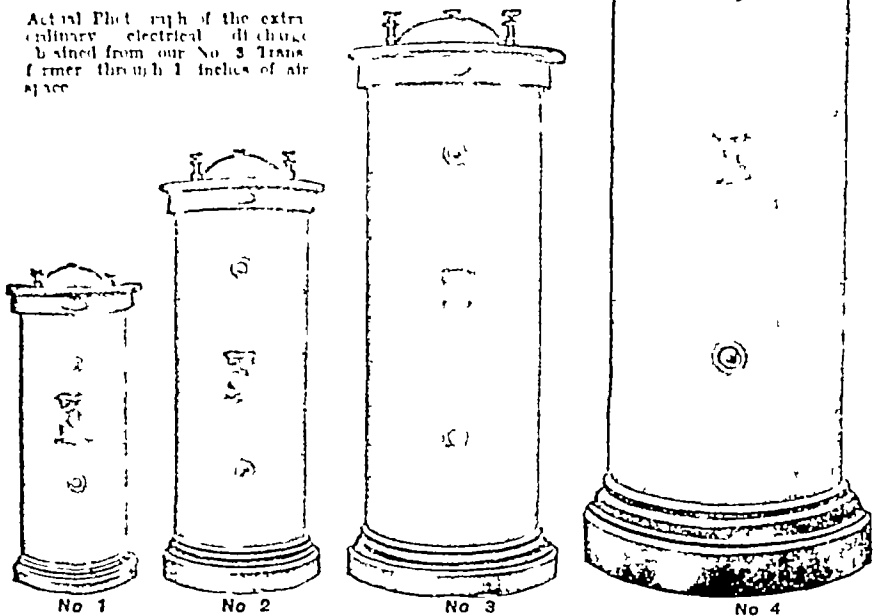
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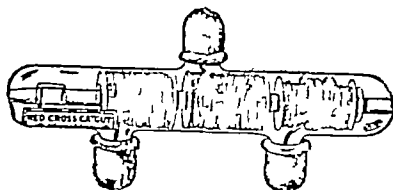
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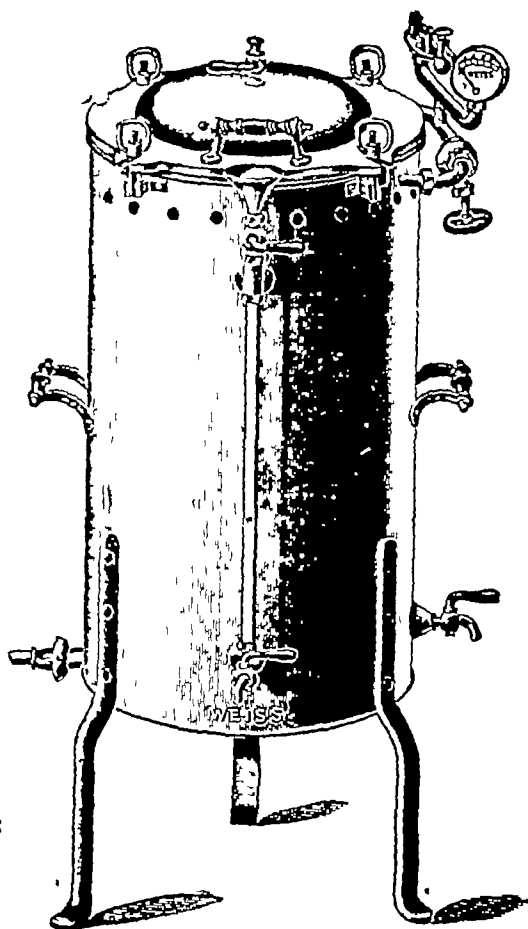
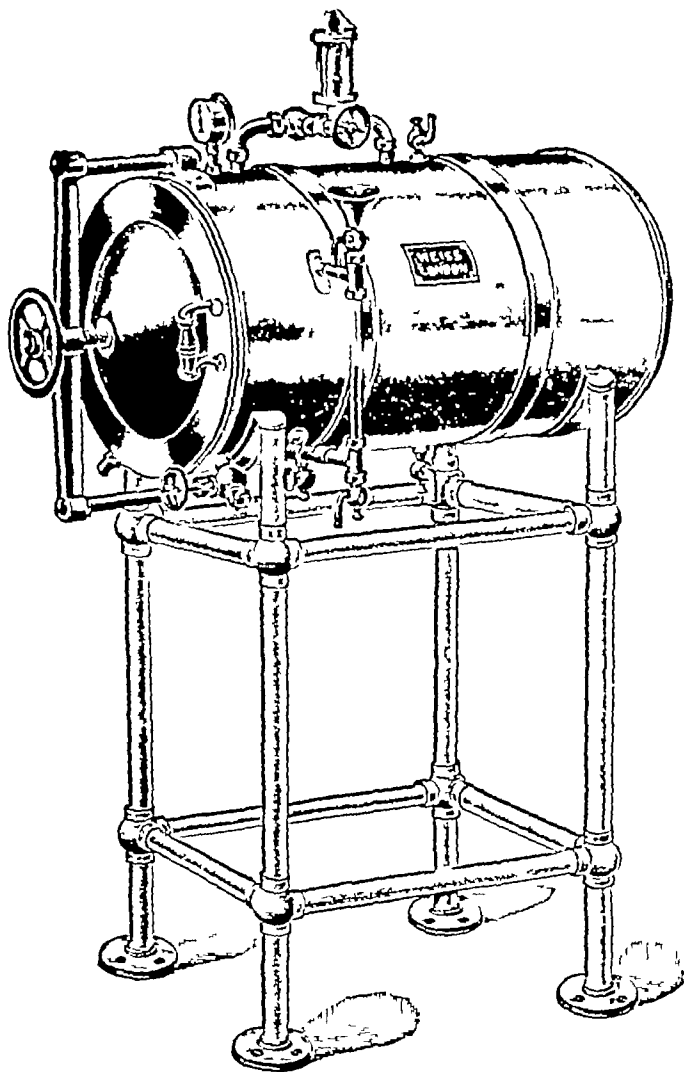
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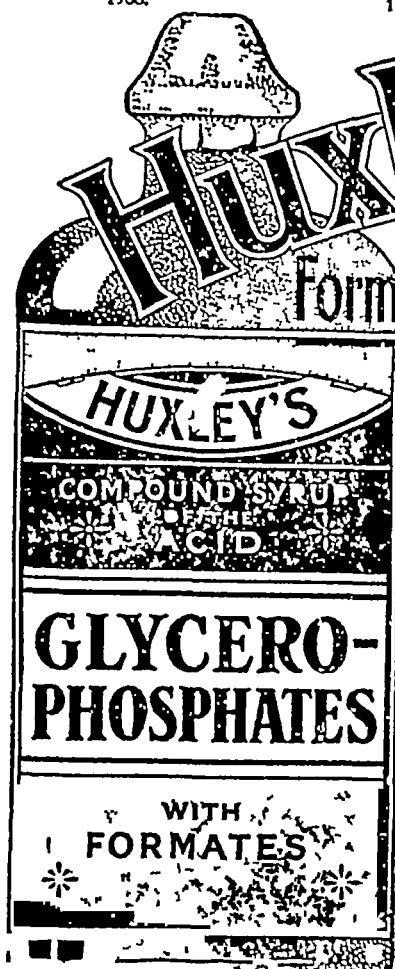
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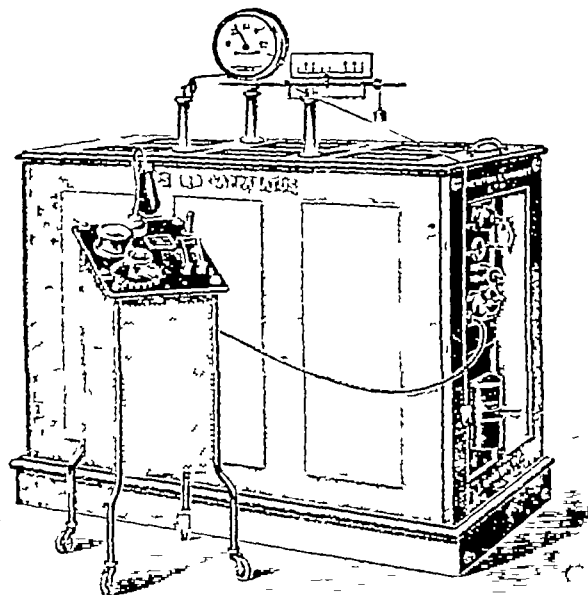
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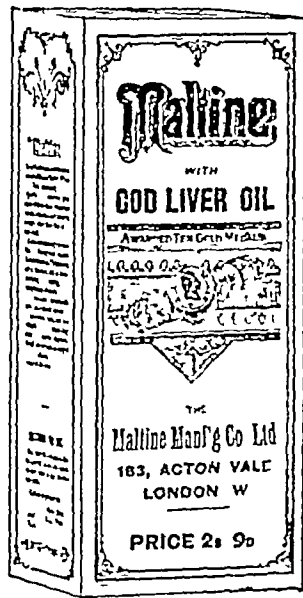
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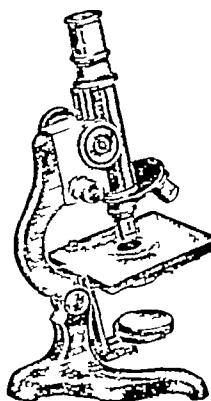
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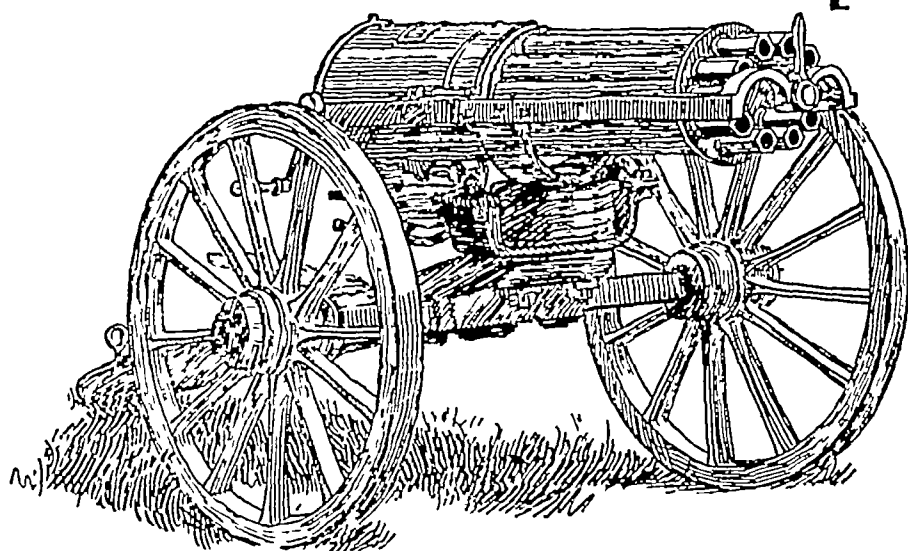
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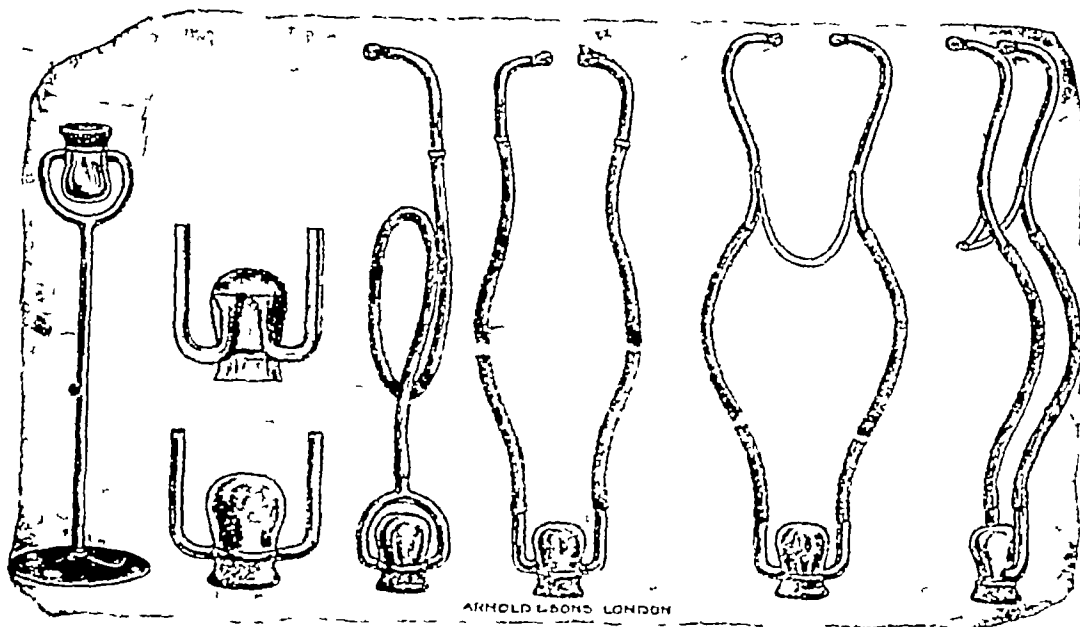
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FIG A

FIG B

FIG C

FIG D

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FIG F.

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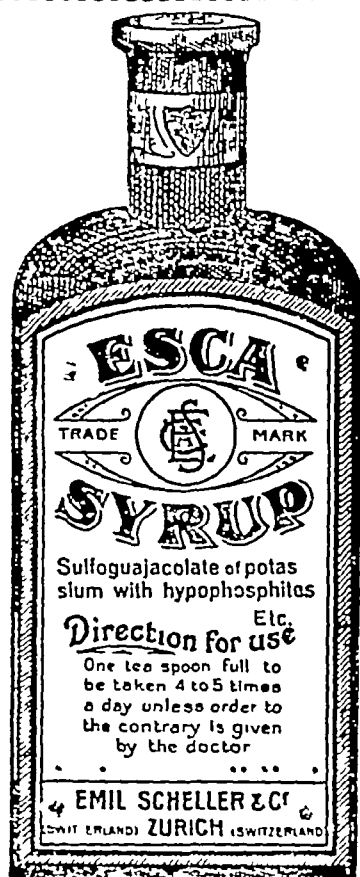
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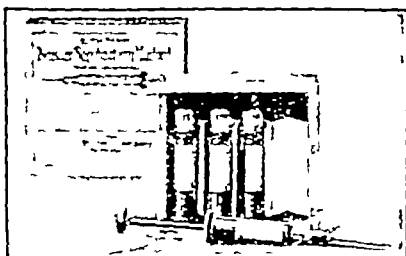
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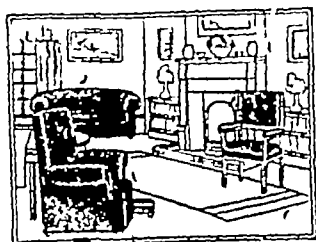
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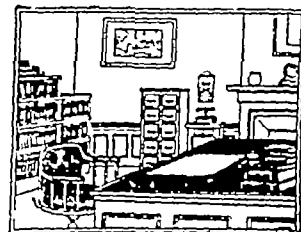
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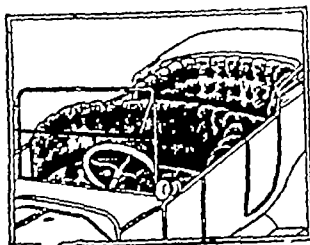
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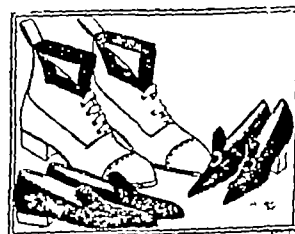
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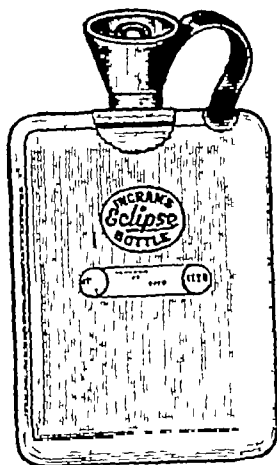
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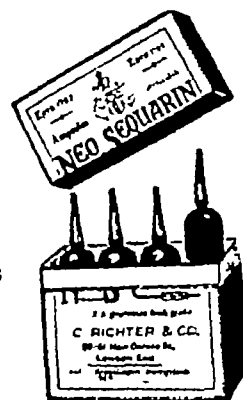
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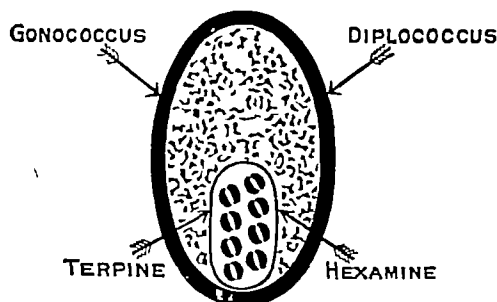
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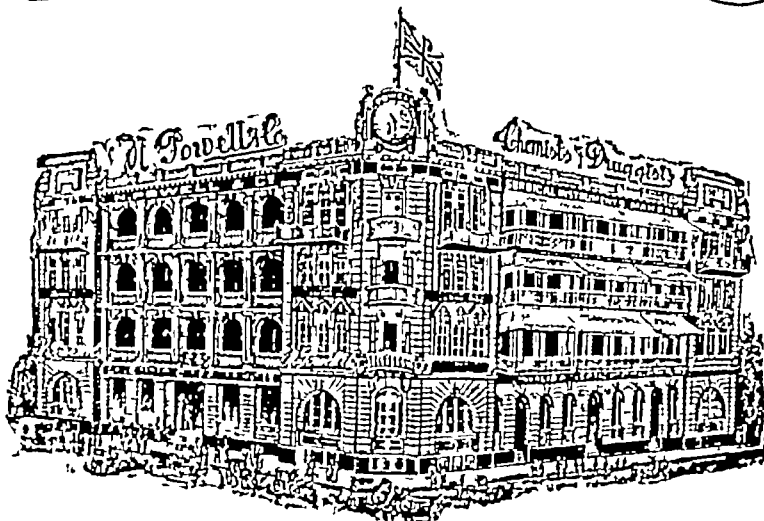
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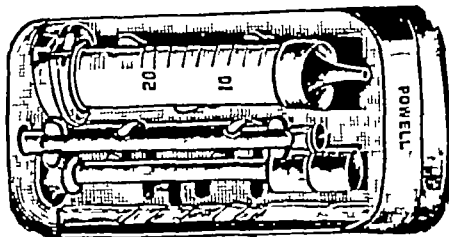


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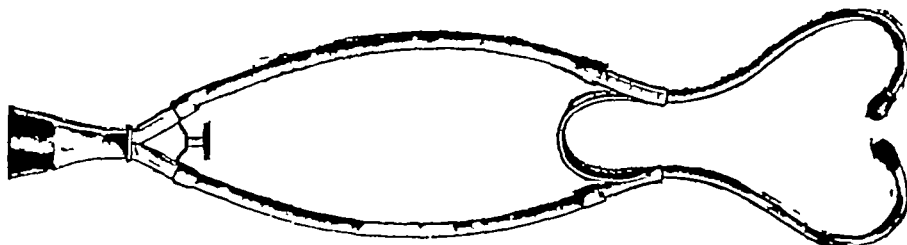
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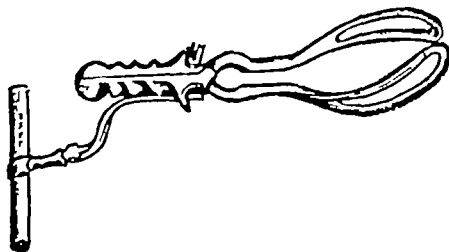
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Fig. 402, Eye Instrument Case containing all instruments in metal handles and the case being velvet lined.

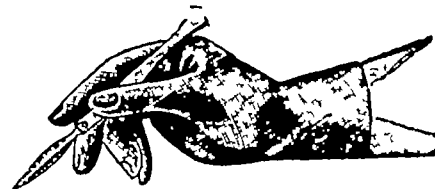
Fig. 402, Eye Instrument Case No. 4.

Fig. 403, Eye Instruments in Morocco Case. All Instruments in metal handles.

Fig. 414, Set of Eye Instruments in Aseptic Metal handles and Metal case (N. P.) with movable racks.

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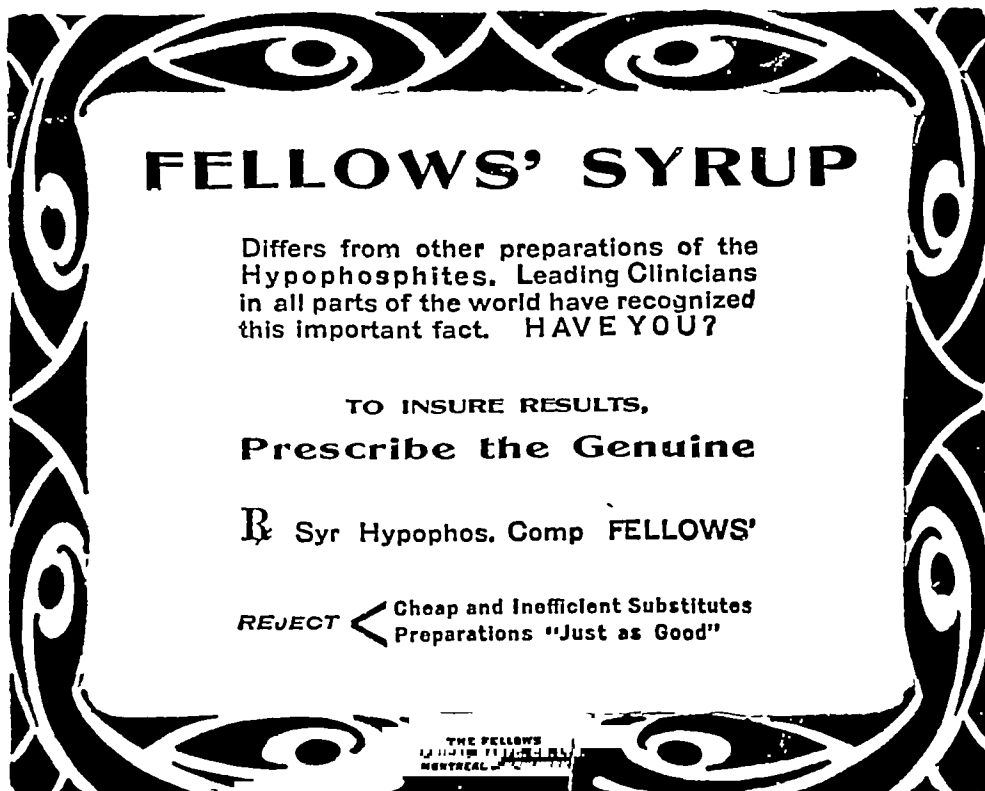
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AUXILIARY MILITARY HOSPITAL, FRODSHAM, CHESHIRE, 9th August, 1917—Messrs Milton Manufacturing Co., Ltd, John Milton House, 125, Bunhill Row, E.C.

DEAR SIRS—Will you please forward 8 gallons of MILTON. We have had very good results from the use of this fluid.—Yours faithfully, (Signed)

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"I wish I could give you as good a report of Milton as it deserves, for I find, as a germicide, and for cleaning up a "foul mouth," it is the best thing I have ever tried, for it acts almost instantaneously and does not irritate the mouth. I have also tried it for Pyorrhœa and other suppurating troubles of the mouth, and it has been splendid because of its strength without the irritation of nearly all other germicides which we use for Pyorrhœa. I constantly use it, and shall continue to do so."

From—Officer in Charge Supplies
To—Officer Commanding

T/11 August 25th, 1917

Milton's Fluid

Reference to the marginally noted disinfectant I have to inform you that while Mr Smith, the manufacturers representative, was here, he not only demonstrated this preparation to me, but I also made a test of the same for our own satisfaction.

This test consisted of spraying a piece of beef with the solution and leaving the same outside in the sun, the idea being to see the result from flies.

The meat remained in the open air seventy hours before it became fly blown and it is doubtful in my mind if there would have been fly blows at that time, had it not rained the previous night. The rain, no doubt, washed off the solution, but even at that, though the fly blows were in a tissue pocket, and the meat had become dark in colour, externally only, due to having been seared from the sun's heat, when cut open was very fresh in both colour and smell, and was quite edible.

If the present intention to issue freshly killed beef is to be put in operation this solution will be invaluable to me. I have had no occasion to use the solution on frozen meat only having used the preparation as a straight disinfectant in the butchery where I find it certainly purifies the air, and takes away any odour there may be.

I find it very good for removing the odour arising when mutton has been hanging any length of time.

To—Major , London

Personal

Remarks by the Supply Officer above in connection with the test made of Milton at the Supply Depot of this Station are forwarded please I might mention what I saw of one or two demonstrations made by Mr Smith, it could be used to a very great advantage for many purposes both in the Supplies and the Transport Sections of the C. A. S. C. It is by far the best disinfectant I have as yet seen and in view of the fact that fresh meat issues are about to be made, the butcher's shop is going to be not very far short of a slaughter house, and as a disinfectant and fly exterminator for this particular purpose I would strongly recommend the purchase of Milton in this connection.

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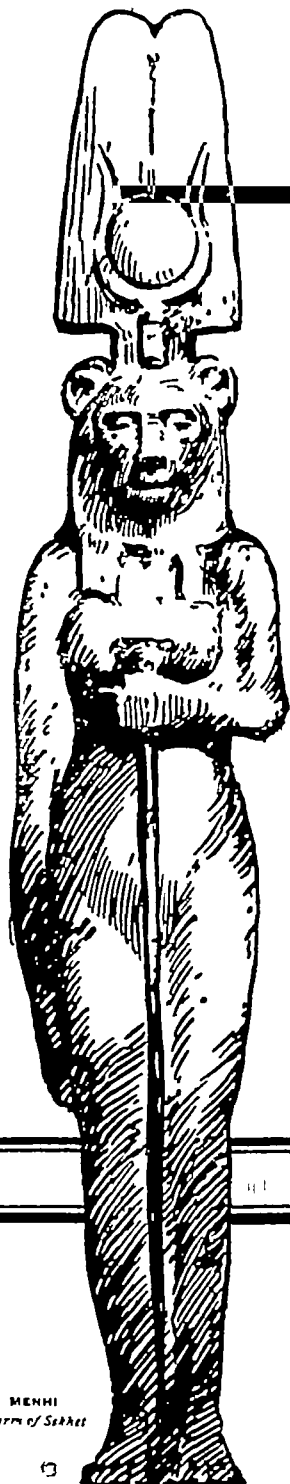
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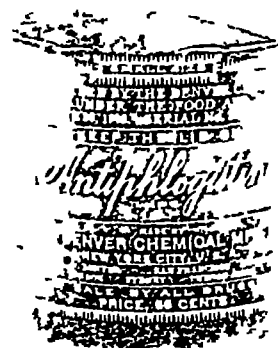
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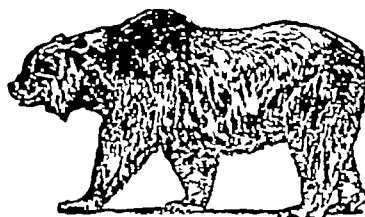
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Original Articles.

STANDARD DIETS

By J. A. SHORTEN,

MAJOR, I.M.S.

(A lecture delivered at the Calcutta Health and Child Welfare Exhibition)

THE subject on which I have been requested to address you this evening is one the importance of which can scarcely be over-estimated. The question of the most suitable diet for human beings has engrossed scientists, and I might add cranks and quacks, throughout the ages. It will be obvious to all of you who live in India, or have travelled abroad, that human beings can live and flourish on many different types of diet and foodstuffs. The diet of the Hindu is not that of the Mohamedan, and the diet of the European is different from both. Yet all three flourish side by side in India. It is obvious, however, that there must be some common basis, for physiologically there is very little difference between individuals of different races. It is to this basis that I wish to direct your attention this evening.

The subject of a standard balanced diet has formed the ground for much controversy. Books and pamphlets on dietetics have been written and are being written *ad nauseam*. Those who believe in our ultimate descent from monkeys point to our dentition and say man was meant to be a vegetarian. Others, noting the superior development and predominance of the meat-eating races, hold that the development of the human race began when man became a hunter and, so to speak, tasted blood. Each view may be right in its own way, but the fact remains that man is an omnivorous animal and flourishes best as such. In seeking for a properly balanced diet we must start from this assumption. I do not propose, however, to discuss the various theories of cranks and faddists, but to confine myself to well-established facts,—facts which are capable of experimental proof.

Until a few years ago physiologists and physicians were satisfied that bed-rock had been reached in the matter of diets. Quite recently, however, new facts have come to light. The Great World War which brought misery to thousands has been the means of shedding light on many medical and hygienic problems. The question of an adequate and well-balanced diet is not the least of these. Among other things that the war taught us is the fact that most of us who are fairly well to do can live on much less than we usually eat, in fact, we should feel better and be better with less food. In England during the war many essential foodstuffs such as butter, meat, milk, and sugar were of necessity reduced to a minimum, and people generally did not seem to suffer in consequence.

The minimum, however, is not necessarily the optimum. We must remember that we are not delicately balanced mechanisms but living beings,—our powers of adjustment are almost unlimited. A speck of dust will stop the delicate movements of a watch, but it would take many specks of dust to stop beating of the human heart. The recent dismal mechanistic physiology, to quote Bayliss, is passing away and is being to some extent replaced by the ancient ideas of vital force.

To return to the elucidation of the problem before us let us ask ourselves what is the purpose of food. In this connection Professor Bayliss, the eminent physiologist, writes —

"The purpose of food is two-fold—on the one hand, to serve as material out of which the structures of the body are produced, and, on the other hand, to afford the energy required for muscular work by being burnt up and oxidised." Food, as it were, on the one hand, goes into the walls of the human edifice, and on the other hand into the fire on the human hearth. Food is used for constructive purposes chiefly in the young and growing animal. The amount required to replace ordinary wear and tear of the active tissues is very minute. So that the greater part of the food of adults is used to supply the human engine with fuel.

Theoretically any combustible substance that can be digested and absorbed may serve as a source of energy, but practically our choice is very limited. Petroleum, for instance, when burnt in an internal combustion engine is capable of yielding an enormous amount of energy, but it is perfectly useless as food.

There are three classes of chemical compounds available as foodstuffs, *viz.*, protein, fats, and carbohydrates. Examples of proteins are egg white, meat, etc., of fats, butter and suet, and of carbohydrates, sugar, starch, flour, etc. It is found that certain minimum quantities of each of these foodstuffs are necessary to maintain the body in an equilibrium of material and energy. But these are not sufficient for the maintenance of perfect health. We require in addition water and certain mineral salts, such as chlorides and phosphates of sodium and potassium.

These five substances, proteins, fats, carbohydrates, water, and salts, are usually referred to as the proximate principles of food. Until recently these five proximate principles were, with the oxygen we take in through our lungs, considered all-sufficient for the maintenance of life and perfect health. It is now recognised, however, that certain other substances, called accessory food factors, are necessary. The absence of these for any length of time will lead to one of the so-called deficiency diseases. Of these accessory food factors one is called *fat soluble "A,"*—a substance which is found in animal fats such as butter and suet, and also in certain of the leafy vegetables and grasses, but not in vegetable oils or fats such as go to make margarine. This substance is necessary

for the growth and development of young animals. Young rats, for instance, fail to grow and eventually die if fed on a diet from which this substance is eliminated. The importance of this discovery in considering the diet of infants and young children is self-evident. The second accessory food factor is called *water soluble "B"* since it is soluble in water. This substance is widely distributed in the vegetable kingdom, being found in abundance in the wheat-germ and yeast. It is also present in certain animal substances, such as yolk of egg. It appears to be necessary to prevent the development of beri-beri. Fat soluble "A" has recently been shown by Mellanby to be identical with a substance which prevents rickets. In addition to these two groups of substances there is a third which prevents scurvy. According to our present knowledge, then, the substances which go to make up an adequate diet are —

- 1 Proteins
- 2 Fats
- 3 Carbohydrates
- 4 Water
- 5 Salts
- 6 Accessory food factors, of which we know three — Fat soluble "A," water soluble "B," and the antiscorbutic factor

The characters of a suitable and healthy diet may be summed up as follows —

- (1) It must contain the proper amount and proportions of the various proximate principles
- (2) It must be adapted to the age and weight of the individual, the amount of work he performs, and the climate
- (3) The proximate principles must be present in a digestible form. For instance, peas and beans contain a large percentage of protein, but in an indigestible form, and, therefore, are not as good a source of protein as meat

In order to arrive at a standard diet physiologists in the past have been at pains to strike a balance between the amount of nutriment ingested and the amount excreted in various ways. The two most important chemical substances concerned are carbon and nitrogen. It has been found that a healthy man eliminates 250–280 grms of carbon and 15–18 grms of nitrogen daily. These must be replaced by carbon and nitrogen in the food. Now, chemistry tells us that the main source of carbon is the carbohydrates, and that of nitrogen the proteins. Hence the great importance of these two foodstuffs or proximate principles.

The value of diets is usually expressed in terms of their heat-value, that is, the amount of energy they can liberate as heat on complete oxidation. The unit of heat-value is the caloric, or the amount of heat required to raise the temperature of one kilogram of water by one degree centigrade.

It will be clear to all of you that the necessary amount of food will vary in proportion to the amount of work done. But even when we

are asleep energy is being used by the heart and other vital organs, and also to keep up the body temperature. This "basal metabolism," as it is called, has been calculated at 1,700 calories per day for a man of 11 stones. If we then add on to this the amount required for various types of work we arrive at a basis for a standard diet. For instance, a tailor, doing light work, would require about 2,500 calories per diem, a metal worker 3,800, and a wood sawyer 5,500.

To give a concrete meaning to these figures Professor Bayliss gives the amounts of various foodstuffs required to furnish 100 calories roughly as follows —

Butter	$\frac{1}{2}$ oz (13.5 gms)
Cheddar cheese	$\frac{3}{4}$ oz (22 gms)
Sugar	$\frac{3}{4}$ oz (24.5 gms)
Oatmeal	1 oz (28 gms)
Mutton	1 oz (29 gms)
Fish	$2\frac{1}{2}$ oz (67 gms)
Eggs	$2\frac{1}{2}$ oz (68 gms)
Milk	5 oz (145 gms)

From figures such as these we can readily calculate the amount of different foodstuffs we require. We must, of course, always allow for food which may not be digested and utilised. An addition of 10 per cent is usually considered to be sufficient to cover this loss.

Working on the above lines various physiologists have arrived at certain standard diets, one of the best known of these classical diets is that of Ranke. It consists of —

Protein	100 gms
Fat	100 gms
Carbohydrates	250 gms

This diet has a heat-value of about 2,500 calories. Voit and others give more liberal diets.

The diet recommended by a Committee of the Royal Society, appointed during the late war to work out a diet for the nation, was as follows —

Protein	70 gms	280 calories
Fat	90 gms	810 calories
Carbohydrate	550 gms	2,200 calories

Total 3,290 calories

This diet is considered suitable for a man of 11 stones doing moderate work. It will be noted that it is somewhat poorer in protein and richer in carbohydrate than the classical diet mentioned above. Tables have been drawn up from which the total calorie value of a given diet can be calculated. Moreover, as Professor Bayliss points out, most of the complex articles of diet such as bread, potatoes, etc., contain a sufficient proportion of protein,—a fact which he has expressed in the aphorism, *Take care of the calories and the protein will take care of itself*.

We may now turn for a few moments to the different proximate principles and consider their use individually and their history in the metabolism of the body.

Proteins—As already pointed out, we require nitrogen to replace that eliminated in the excretions, and to build up the structural machinery of the body. This nitrogen we take in the form of protein. Now, protein is absorbed with difficulty from the intestinal canal. Hence the necessity for digestion. Protein is broken up into simpler substances by the digestive juices and is finally absorbed in the form of amino-acids. Part of the absorbed amino-acids are converted by the liver into urea, which is eventually excreted, and the rest pass on to be built into the tissues. Only a small moiety of the protein absorbed goes to supply energy. The amount of protein required is relatively small, as it depends on the amount of tissue waste to be repaired, and is not important as an energy-yielding food. The Royal Society Commission recommended a ration of 70 gms daily—part of which should come from animal sources. The majority of the classical standard diets include 100 gms or over.

High protein diets are condemned by various writers. Chittenden, for instance, as a result of experiments on students, soldiers and athletes, came to the conclusion that 30 to 50 gms of protein daily, according to the weight of the individual, is all that is needed. The period of observation, however, lasted only a few months, and it is clear now that he was deceived by some of the subjects of his experiments.

McCay calculated that the average Bengali metabolises only 37.5 gms of protein,—a figure which closely approximates those of Chittenden,—and maintains health thereon. But on the other hand he draws attention to the marked physical inferiority of the Bengali when compared with meat-eating races living under similar conditions, and the great prevalence of renal diseases amongst them.

Our instinctive appetites lead us when possible to adopt a diet with a high protein content, and it would seem to be only reasonable to encourage a certain margin of safety. The Roast Beef of Old England is a phrase which may have more in it than meets the eye, as the Boche found to his cost.

Before leaving the subject of proteins a reference must be made to the so-called purin-free diets, the advocates of which claim so much. The best known of the purin bodies is uric acid, a substance which is probably the most maligned of all chemical compounds. Half the ills to which human flesh is heir are attributed to it. Purin bodies form components of the nuclei of the cells of the body, and are normally excreted in small amounts. Excess of uric acid is undoubtedly associated with gout, but there is no proof apart from this that the group possesses any particular toxic properties. It is interesting to note that caffeine, the chief alkaloid of coffee and tea, and theobromine, the active principle of cocoa, are closely related to the purin bodies. You will

be pleased to know, however, that the balance of scientific opinion is against advocates of this fantastic diet, and you may continue to enjoy your tea, coffee and cocoa without fear of the dire evils which they say will befall you.

Carbohydrates—These can be dismissed in a few words. They form the chief source of our supply of energy. Since they contain no nitrogen they have little to do with tissue growth or repair. The chief carbohydrates taken as food are starch, cane-sugar, milk-sugar, maltose and glucose (in fruit, etc.). They must all be converted into glucose, or some simple sugar of the same group, before absorption. This change is chiefly brought about by the saliva. Hence the importance of properly chewing starchy foods. After absorption they are partly stored in the liver as glycogen, and the rest is passed on to the tissues, especially the muscles, where it forms the main source of the energy required for muscular contraction. Carbohydrates, therefore, are of great importance to those who undergo prolonged or severe muscular exercise, such as is involved in mountain climbing and marching. On the other hand, excess of carbohydrates, such as sweetmeats, is liable, in the indolent, to lead to failure of the mechanism for digesting and utilising them, and eventually to diabetes, as has been shown by McCay and his collaborators.

Fats—As already mentioned, both proteins and carbohydrates are absolutely necessary constituents of our food on account of the necessity of replacing the nitrogen and carbon lost in the excreta. The same cannot be said of fats, except in so far as they serve as a vehicle for the fat soluble vitamins. Fat is formed from carbohydrate in the body. In fact, the excess of carbohydrate ingested is up to a certain limit laid down in the body as fat. The digestive juices split fat into fatty acids and glycerine, which are recombined as they pass into the lymphatics, so that the absorbed fat eventually appears in the blood in the form of fine droplets.

Fat is a very concentrated form of energy-giving food, yielding 9 calories per gram as compared with 4 calories per gram each in the case of proteins and carbohydrates. The Royal Society recommended that 28 per cent of the total calories of a diet should be in the form of fat.

Salts—No special provision need be made for salts. They are present in many of the usual articles of diet, such as fruits, vegetables, and salads.

Water—The necessary supply of water is regulated by the feeling of thirst. Neither water nor salts afford energy, but, as Bayliss expresses it, they are necessary in the same sense as lubricating oil is to a motor.

Accessory food-factors—The fat soluble "A" factor is necessary to ensure growth—particularly in children and in adults recovering from wasting diseases. It is, therefore, important

that growing children should have a plentiful supply of fresh milk, butter and eggs. In the absence of these, codliver oil may be given as a substitute or as a medicine.

As regards the water soluble "B" factor, this, as already mentioned, is widely distributed in the common articles of diet. Danger arises, however, from a one-sided diet, as when polished rice, or white bread forms the staple diet. This vitamine is concentrated in the outer layers of the grain, and this is the part removed by the process of milling. The seed-germ, too, which contains a large proportion of the vitamine, is removed by the same process. The importance of unpolished rice and whole meal bread to a community living mainly on these foodstuffs cannot, therefore, be over-estimated.

The anti-scorbutic factor—This is a recent discovery, although scurvy is one of the oldest of the recognised human diseases. It has long been recognised that fresh fruit and vegetables are necessary to prevent the appearance of this disease among bodies of men such as sailors and troops. The classical Treatise on Scurvy, by James Lind, published 150 years ago, gives an excellent account of this disease and the use of fresh vegetables and fruit in its prevention.

The recent researches of Harriet Chick and Margaret Hume have added greatly to our knowledge of anti-scorbutic vitamins. Working with guinea-pigs, which readily develop scurvy on a basal diet of grain and water, these authors investigated the preventive effects of the addition to the basal diet of (1) fresh and dried vegetables, (2) fresh fruit juices, pulses soaked and germinated, (3) milk, (4) meat.

Their results and those of various American investigators go to show —

(1) The protective power of small quantities of fresh vegetables.

(2) Vegetables dried at high temperatures have no anti-scorbutic properties, but if dried at low temperatures they retain an appreciable amount of this virtue.

In this connexion, in conjunction with Dr Charubrata Ray, I have recently been able to demonstrate that certain of the sun-dried vegetables from Quetta, which correspond to the "low-dried" factory product, also retain considerable anti-scorbutic powers, those specially active being sun-dried tomatoes, potatoes and cabbage.

(3) Fresh lime juice protects, but stale or artificial products are useless.

(4) Fresh milk has considerable power, but if subjected to prolonged boiling or heated to 120 degrees C, it loses its power of protection.

(5) Fresh meat has some preventive properties, but they are not so marked as in vegetables, etc.

Among other facts demonstrated by various research workers is the fact that ordinary boiling of vegetables does not diminish to any great extent their anti-scorbutic properties, but if

the boiling is prolonged, or if alkalies such as bicarbonate of soda are added to the water, the vitamine is quickly destroyed. Prolonged cooking such as that involved in the hay-box method of cooking, in vogue during the war, is thus unsuitable for any substances of anti-scorbutic value (fruit and vegetables).

It also follows that tinned rations, vegetable or otherwise, which have been raised to 120 degrees C in the process of manufacture, are devoid of anti-scorbutic properties.

One of the most important discoveries made by Chick and Hume is that although dried pulses have no anti-scorbutic properties, if moistened and allowed to germinate, the anti-scorbutic elements re-appear in 48 hours, and that such freshly germinated material may be cooked for from 1 to 1½ hours without destroying the anti-scorbutic vitamins.

In conclusion you will naturally ask—How can the layman apply all these principles in daily practice? A few simple diet rules will best answer this question. These are —

1 Avoid a one-sided diet, remembering that you require proteins, fats, carbohydrates, and accessory food factors.

2 As good digestion is said to follow appetite, have your food cooked to satisfy your tastes and desires.

3 In the case of children, remember the importance of fat soluble "A" and give fresh milk, butter and eggs. Fresh orange or lime juice should also be given daily to prevent the possible development of scurvy.

The question of fresh milk is a difficult one on account of the danger of infection by enteric germs, cholera, etc. But if you can't keep your own cows it will be possible for many to keep goats which can be milked under your personal supervision. If you can't do either, remember the value of codliver oil.

4 Remember the value of whole meal flour and unpolished rice when flour and rice form the main articles of your dietary.

5 Remember the anti-scorbutic value of fresh vegetables and fruits. As regards the danger of cholera or typhoid, fruits the skin of which can be removed, such as oranges and plantains, are always safe. Fresh vegetables such as salads can be made safe by simply scalding in boiling water or using some simple disinfectant such as Condy's fluid.

6 Lastly, do not boil your vegetables for too long a time and, above all, do not add soda to soften them.

These few simple rules sum up all the most recent knowledge on the subject of diets.

TYPHUS AND TYPHUS-LIKE FEVERS IN BIRJAND, EAST PERSIA

By A S FRY,

CAPTAIN, I M S

TYPHUS FEVER has been met with frequently by the Medical Services in the northern part

of East Persia, both amongst the inhabitants and amongst our own troops. The Russians in Transcaspia have suffered heavily from the epidemic disease.

The following notes were gathered from nine cases of typhus or typhus-like fever which were met with in Birjand during 18 months of hospital experience amongst the garrison of troops stationed there. Six of these cases were admitted to hospital during May and the last few days of April, 1919. One case occurred in the middle of June, and the other two during the first three days of July, 1919.

Case 1—The first admission was a young Indian clerk of the Works Department, on April 24th, complaining of fever since the previous day, severe headache and backache. There were no physical signs to note other than a furled tongue. The blood was negative for malarial parasites and for spirilla. The following evening the blood was again examined without result. On the fourth day of the disease the tongue was very red and fissured. The throat was congested and the uvula œdematous. There were no head symptoms or signs. On the fifth day the patient declared that he felt better, and the pain in the head and back was less. A few red spots, which faded on pressure, were observed over both arms and on the trunk. The patient was promptly isolated under suspicion of suffering from fever of the enteric group. On the sixth day the rash was well developed, especially over the back of the trunk and on the flexor aspects of the limbs. There was tenderness on palpation over the right costal margin, but no enlargement of the liver or spleen. On the seventh day the rash was fully developed all over the body, including a few spots on the face. Headache persisted, he did not complain of backache. The spots were pin-coloured, perceptible to the finger, and faded on pressure. They varied in size from typhoid-like spots to circular macules $\frac{1}{4}$ in diameter. On the ninth day signs of congestion were present at the bases of the lungs. On the tenth day the rash began to fade. The patient was listless and drowsy, and the pulmonary congestion gave rise to anxiety.

On the thirteenth day the patient passed his motions involuntarily in bed. On the sixteenth day the motions contained blood and mucus. The general condition was slightly better, as the incontinence of fæces did not continue. A starch, bismuth and opium enema was administered. The stool was subjected to microscopical examination, but no amœbæ were found. On the seventeenth day the rash had almost entirely faded, leaving a few brownish stains which disappeared in the course of the next ten days. No petechiæ were present. On the eighteenth day eight doses of magnesium sulphate were given—drachms two every two hours. This had no effect on the colitis. On the twenty-first day emetine hydrochloride gr $\frac{1}{2}$ was given hypodermically morning and evening,

and repeated daily twice until twenty such doses had been given. On the twenty-second day the lungs were normal. The tongue was moist and covered with flakes of sticky, white coating. The stools daily consisted mostly of blood and mucus. On the twenty-eighth day a small, punched-out bed sore formed over the sacrum. The tongue was clean. The colitis continued. On the twenty-ninth day he passed the first stool without blood or mucus since the onset of the colitis, but in the evening the stool contained a little blood. The next day the stools were free from blood and mucus, and of watery consistence. On the thirty-sixth day the motions became soft, semi-formed, yellow in colour, but still rather frequent. On the forty-second day the stools became finally normal in frequency and consistence.

The bedsores healed slowly during the course of the next month. The patient, who had been much reduced by the illness, slowly regained his strength and weight. No bands of conjunctival congestion were noted as have been described in typhus fever, but there was a certain degree of bulbar congestion under cover of the lids. Towards the end of the fever and during the first few days of convalescence the patient displayed a weakness in protruding the tongue, which was tremulous, and inability to protrude that organ fully. On 19th July he was discharged from Hospital, fit and well-nourished. He was ordered a fortnight's rest before he resumed his clerical duties. Eighteen days later he died after an operation at which a gangrenous appendix and retro-cæcal abscess were found. It is interesting that a blood-count performed before the operation showed a polymorph percentage of only 70.5, which leads one to speculate as to the possible connection of this late complication with the early dysenteric lesions.

Cases 2, 3, and 4—On April 27th, a private follower of certain clerks of the Audit Department was admitted to hospital with fever. Three days later one of his masters was admitted with the same complaint, and on May 4th his other master, who was the father of the young lad whose case has been described, also succumbed.

All four men were fair-skinned. In all four cases the rash was similar, profuse, well marked and never petechial. The spots were most numerous on the trunk and upper arms, the face, if affected, showed only a few spots. A few spots appeared on the fifth or sixth day of the fever, the rash was fully developed on the third or fourth day of its appearance and then faded gradually until about seven to ten days later brownish stains were left which slowly disappeared without any marked desquamation. The watercourse appearance was not observed except in one case where there was a very faint mottling of the skin of the back on the day of the appearance of the rash.

In other respects these three cases resembled clinically that already described, except that bedsores and colitis complications were absent. The prostration was not so marked, nor was the tongue sign present except during the last two days of the fatal case. The patient might feel out of sorts for one day before the fever became evident to him. The general symptoms of fever were present—febrile aches and pains, headache—not so marked as in relapsing fever—and backache. Pulmonary congestion, as evidenced by crepitations and rhonchi heard over the bases of the lungs, appeared in each case from the third to the sixth day after the appearance of the rash, clearing up in about a fortnight in the three cases which recovered. The liver edge was noted as tender in the first case described, and the organ was slightly enlarged during the height of the fever in another case which recovered. No splenic changes were noted. In each case there was some degree of looseness of the bowels both during the fever and also during the first week or two of convalescence.

The two clerks made a rapid and complete convalescence. The private follower died. He was a well-nourished man admitted on the second day of fever. The rash developed on the sixth day. The next day he had slight epistaxis from the right nostril. On the ninth day the rash was fully developed and very profuse, being the most marked of the four, although the face was not affected. A brownish tinge was noted on the white-coated tongue. Pulmonary congestion developed on this day. On the thirteenth day he was doing excellently well and gave cause for no anxiety. Morphia hypodermics had been given for sleeplessness, and the effect, carefully noted, gave no contraindication to its use. On the fourteenth day, however, the patient was found to be apathetic, and was induced to take his nourishment with some difficulty. The pulse was good, there was no delirium, but the tongue was rather dry and crusted. On the morning of the fifteenth day he suddenly collapsed, and his sunken eyes and pinched features presented a remarkable change from his appearance on the previous day. Towards noon he passed into a condition of unconsciousness and died at 2-35 P.M.

The blood was examined in all cases several times and no spirilla or malarial parasites were found.

Case 5—The fifth case I submit as an example of mild, abortive typhus. The patient was a clerk from the same office as the other two audit clerks. He was admitted to hospital on May 9th, on the second day of fever. The blood was examined on the morning and evening of this day—no malarial parasites or spirilla were found. The patient was well nourished and had no symptoms at all throughout the fever except anorexia which persisted during the first three days of convalescence. The

spleen did not enlarge. On the fourth day a general blushing of the skin over the body and limbs was noted, and two pink spots were observed on the left upper arm. A few crepitations were audible over the base of the left lung. The next day the spots and erythema had disappeared and the lungs were clear. This patient was also fair-skinned. He made a rapid and complete convalescence.

Case 6—My next two cases were dark-skinned natives of South India. My private bearer was admitted to hospital on May 30th, on the third day of fever. The blood was examined on the third, fourth and ninth days without result. The fever commenced with a rigor and vomiting. On admission he complained of frontal headache, pain in the epigastrium and vomiting. The tongue was moist and coated with a brownish fur. The patient rapidly became extremely prostrated with a dry, brown, crusted tongue on the ninth day, which he was unable to protrude beyond the lips. The spleen was enlarged slightly but not palpable. No rash was observed and no lung signs, but the latter were not sought for too eagerly owing to the dangerous condition of the patient. After the first week of convalescence he emerged from his critical state and commenced to improve steadily. He made a complete recovery. This man had been inoculated with two doses of T. A. B. vaccine twelve months previously.

Case 7—The other patient was a sepoy from the station garrison admitted on June 17th, on the third day of fever. The blood was examined four times without result. No rash was seen. Rapid prostration was marked. The tongue quickly became dry, and when the patient tried to protrude it, the tip caught on the lower incisors and the tongue was not protruded beyond the lips. This sign was well marked on the twelfth day and persisted up to the eighteenth day, when the tongue became moist and thickly coated with yellowish fur. There was diarrhoea during the early part of the illness and also during the secondary fever, the stools being of pea-soup colour and consistency. Pulmonary congestion appeared on the sixth day and on the eighth day the lungs were full of rhonchi and bubbling râles. From the ninth to the eleventh day the pulse was dicrotic, thereafter the blood pressure improved. On the twentieth day the patient, although very debilitated, appeared to be mending. The lungs were clear, the moist tongue, still thickly coated, with clean tip and edges, could be well protruded. The next day, however, a secondary fever supervened. On the twenty-fifth day the fur on the tongue assumed a brownish tinge. There was tenderness in both hypochondriac regions, but neither spleen nor liver was palpable. The blood showed leucopenia.

On the twenty-seventh day the heart assumed a fetal rhythm. The base of the right lung was dull on percussion, and the breath sounds diminished, there were no accompaniments.

The patient gradually sank from exhaustion, the fetal heart rhythm persisting. Three days before death a few fine crepitations were audible over the bases of the lungs, so that this secondary fever probably denoted a low form of pulmonary inflammation which resulted in death about noon on the thirty-fourth day.

Cases 8 and 9—The last two cases were two Persians from the Seistan Levy Corps admitted on the first and third days of July respectively. They had white skins, but their rashes were not nearly so marked as in the first four cases. Both were well-nourished men and did not appear to suffer much from the effects of the illness, as both were clamouring for release from hospital within a week of the subsidence of the fever. The symptoms consisted of febrile aches and pains and mild frontal headache. The blood, examined several times, was negative for malarial parasites and spirilla. Only one showed inability to protrude the tongue, this sign occurring from the ninth to the eleventh day. Both had well-marked enlargement of the spleen during the fever, and one had slight enlargement of the liver. Signs of pulmonary congestion absent in one case, were present in the other on the sixth day, when slight hæmoptysis occurred. The rash appeared on the fifth day in one and on the eighth day in the other. In both it consisted of a mottled erythema and pink erythematous spots over the trunk and upper arms, appearing together. The spots, which did not become petechial, commenced to fade on the second to third day after appearance, and the mottling was the last element to vanish on the fifth to seventh day of the rash, leaving no desquamation or pigmentation.

Case 10—I had one more case, which was returned as fever of the enteric group, but to my mind resembled much more the fevers I have described. This was a sepoy of the Station Garrison admitted to hospital on August 5th, on the second day of fever. He was dark-skinned and no rash was observed. On admission he complained of slight headache, severe backache and pain over the front of the chest. The tongue was rather dry and lightly coated. The spleen was enlarged, but not palpable owing to the rigidity of the abdominal muscles. There was tenderness on palpation in the right hypochondrium. Signs of pulmonary congestion were present, there was diarrhœa with "pea-soup" stools. Blood examinations were negative. On the seventh day the spleen was palpable at the costal margin and did not enlarge further. On the ninth day the patient presented the prostrated condition of typhus, the tongue was dry and covered with innumerable cracks, its margin was red and raw, it could not be protruded beyond the lips owing to the tip catching on the lower incisors. There was no delirium, but the patient was very weak and had wasted considerably. The motions were watery, brown-coloured, and contained flakes of mucus tinged

with blood. The pulse was small and not dicrotic. The spleen was palpable at the costal margin, and liver edge palpable and tender. There was no jaundice and no distension of the abdomen. On the fourteenth day the diarrhœa ceased and the patient felt much better. There was still some lung congestion.

On the fifteenth day the spleen had receded under the costal margin and the liver edge was not palpable, although there was still tenderness on palpation in the right hypochondrium. A small, hard, tender swelling was noticed in relation to the under surface of the left lower jaw near the angle. This increased in size towards the middle line. A carious lower molar was extracted from the left side on the sixteenth day, but no pus was obtained. On the twenty-first day the abscess burst into the mouth, *via* the socket of the extracted tooth, and about 2 oz of foul, greenish-yellow pus was expectorated. By this time the lungs were clear, but the tenderness over the right costal margin remained. On the twenty-third day the wound in the neck commenced to discharge greenish-yellow pus, gradually a large slough separated. The wound cleaned and granulated, the patient put on weight and convalesced slowly. During the first four days of October he had a recurrence of diarrhœa, the motions containing large masses of mucus without blood. This responded immediately to a course of mag sulph. The septic complication was, I consider, due to periostitis of the lower jaw. When the patient was transferred down the line towards the end of October he was fairly fit, the liver and spleen were normal.

Among these ten cases there were two deaths. The case of mild typhus was fit for duty after three weeks in hospital. The first admitted case was three months in hospital. The remainder, with the exception of the last case described, were fit for duty within two months of onset. My bearer has been in the best of health since his illness, and distinguishes himself on the football field by his zeal and agility. The clerks are fine specimens of their class and would do credit, in appearance at any rate, to any office.

In the fever charts I think that I could trace some similarity. The febrile course may be divided into two parts: the first part consisting of a more or less continued pyrexia, the second part of a lower, irregular fever tending to remittent or intermittent type, the two parts being separated by a break of pseudo-crisis or pseudo-lysis. Cases 1, 4, 6, 7, 8 and 9 show this feature most distinctly, the break occurring from the 8th to the 11th day. In cases 8 and 9 the second part of the fever is partially suppressed, which was in keeping with the mildness of the cases and the ill-marked rash as compared with the first four cases. Cases 2 and 3 do not show these features. Case 5, which appears to be an abortive form of this fever, shows a break on the eighth day with complete suppression of the terminal

fever In case 10 the terminal fever merges into the fever of the septic complication

ON AN OUTBREAK OF RELAPSING FEVER IN TURKEY IN 1918

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TEL HADI

THE northern part of Mesopotamia, that is to say the country which lies between the rivers Tigris and Euphrates, consists for the most part of a very slightly undulating plain, crossed at long intervals by ranges of mountains—pimpled with extraordinary regularity by small roughly conical hills, some 100–200 feet high, called 'Tels'. This plain is watered by occasional streams and for two or three months in the spring is covered with a green herbage, which the advent of the hot weather about May changes to a brown dust. Towards the west this plain is populated by settled inhabitants who live in numerous villages, but to the east is uncultivated and inhabited only by wandering Bedouin tribes.

In this eastern part is a Tel called by the Bedouins who used to camp about there in the spring of each year 'Tel Hadi,' and this was the spot chosen for the headquarters of one of the sections of the Baghdad Railway construction, when it was decided, during the war, to continue building this railway from Nisibin to Mosul. The Baghdad Railway was being constructed before the war by a German engineering firm, and this construction was continued during the war, for the Turkish government, by German engineers, mostly working with prisoner-of-war labour. Construction was commenced simultaneously at various points along the route, and the whole of the line under construction was divided for administrative purposes into sections. Construction in the Tel Hadi section was begun at the end of 1917, the rail-head then being at Tel Helif, three days' journey to the west.

In April 1918, when the outbreak of relapsing fever began, the section consisted of a permanent headquarters and various camps of workers which changed their position as the work progressed. The workers mostly lived in tents, and those generally black Bedouin ones. The German engineers, and a few of the more important employees, had houses of stone and mud. There should have been a German doctor in medical charge of the section, but the one who was sent was killed in an attack made by the local Bedouins and never replaced, and in consequence from February onwards I had the medical arrangements in my hands.

The hospital was accommodated in two wooden 'barabques' and some stone houses and

tents. The arrangements were very makeshift and primitive, but we were lucky in having a good Leitz microscope and some stains.

Our cases were drawn from this comparatively isolated community of about 800 persons, of at least fifteen nationalities and speaking as many languages,—a circumstance which did not make it easy to obtain good histories from the patients.

The numbers were roughly —

<i>Cases of relapsing fever</i>		
British	38	1
Indians	404	8
Russians	28	10
Germans	7	1
Greeks	30	9
Armenians	25	6
Arabs	30	3
Jews	3	
Turks	150	16
Cherkas & Chichins	15	8
Roumanians	5	
Italian	1	
Kurds	30	1
Maroccans	5	1
Algerians	30	2

CLIMATE AND BLOOD-SUCKING FAUNA

The weather in 1918 was cold and wet until April, and then mild until the 10th of May, when the hot weather began suddenly. In May and June temperatures up to 43 degrees C were recorded inside a stone room in the hospital.

Lice were extraordinarily prevalent throughout the winter, but diminished in numbers as the weather grew hot and the measures for dealing with them became more effectual. A sensible diminution began in June. Everyone was more or less infected with them, but specially the Turks and Russians. Mosquitoes, both culex and anopheles, were numerous from May onwards, and from June onwards we were troubled by a very minute sand-fly. I never saw a bedbug or a tick. Fleas were fairly numerous up to May.

The whole of the headquarters was overrun with mice, and flies were very numerous during the whole of the hot weather.

THE OUTBREAK OF RELAPSING FEVER

Relapsing fever first made its appearance in April, 1918, and continued till June, and it is this outbreak an account of which I think is of some interest, as, so far as I know, it is the only outbreak described in this part of the world, and the results of treatment were extraordinarily satisfactory. There is no disease I know so satisfactory to the doctor. With a microscope the diagnosis is certain, and with meosalvarsan, and no doubt with other arsenobenzene compounds, the treatment is wonderfully successful.

The course of the epidemic is shown in the following table.

The diagnosis was in each case made microscopically and no case occurred which was clinically relapsing fever, in which, at some stage or other, the spirillum was not found.

THE SPIRILLUM

Method of staining—In all cases thin blood films were examined, but I think perhaps a thick drop method would have been better as a routine procedure. The films were stained with Giemsa's stain and examined under 1-12 in oil immersion lens. The spirillum stains rather slowly to a dark purplish blue colour and loses its stain easily if washed with water containing a trace of acid. This point is of some importance as if—as sometimes happened—the Giemsa did not colour the red corpuscles a nice red one was tempted to improve the appearance of the slide by washing it for a moment in very dilute acid. Its appearance was wonderfully improved, and malaric parasites thereby more easily seen but the relapsing fever spirilla were apt to be lost in the process.

APPEARANCE

The spirillum as thus seen was very variable. It varied in numbers found from none at all (and this after 15 minutes' search in a case in which it was subsequently found) to many in each field. The thickness varied from ones so thin as to be hardly visible to a coarse organism like a mouth spirochete, but in the same slide the thickness was fairly constant. Manson and Thornton who also noticed this variation, even suggest the possibility of there being two varieties of the Sp. Duttoni on the strength of it (13). Its length was about 20μ and without accurate measurements seemed to be one of its most constant features (26).

The flexures were open and very irregular and in some cases the parasite took the form of a segment of a circle (13). This was possibly a change occurring when the film dried.

The ends were pointed.

The parasites were always found in the blood during some part of the attacks of fever, and never in the intervals when the temperature was normal. Out of 25 cases examined on the first day of the first attack of fever in five cases they were not found, but in each of these cases were found on the second day. In one case only one spirillum was found on the first day after a long search, and several on the second day (5).

This is a strong indication that the parasites in the first attack reach their maximum number late in the attack rather than early.

I could not find that the number of parasites found in the blood bore any relation to the clinical severity of the disease.

The parasites did not appear to be more numerous at one time of day than another. They were always extracellular, no case of phagocytosis being observed. The injection of neosalvarsan into a vein caused their rapid disappearance from the blood.

Unfortunately, owing to want of apparatus and material, attempts at culture of the organism in vitro, and serum reactions could not be tried.

THE VECTOR

The ordinary vector is certainly the louse, (30), (32), (33), (35), except in Africa where it is a tick—the *Ornithodoros moubata*. The bed-bug can carry the disease (29), and mosquitoes have been thought sometimes to do so (49). No one has discovered a flea doing so (13), (47).

There were many indications that our outbreak was due to lice—

(1) The cases were most numerous amongst the sections of the community which were most infected with lice. No cases occurred amongst the hospital staff who were in daily contact with cases but had special facilities for keeping themselves free from lice. Very few cases occurred amongst the Indian prisoners of war, although these were more numerous than any other nationality. They kept themselves clean.

(2) Several times smears of crushed lice from relapsing fever cases were examined, and on one occasion an undoubted spirillum was found.

(3) There were no—or very few—bed-bugs or ticks, and sand-flies and mosquitoes did not make their appearance till the epidemic had started to decline. The disappearance of the disease corresponded with the disappearance of the lice.

(4) No cases of infection occurred so far as I could find in hospital. The patients were carefully de-loused on admission, but relapsing fever cases were in no way isolated from those suffering from other diseases (cf 47).

MODE OF INFECTION

It is probable that infection takes place not so often from bites of an infected louse as from inoculation of a crushed louse into scratches made when the patient feels the irritation of the bite (1)), (13).

THE BREEDING OF THE PARASITE IN THE LOUSE

It is generally admitted that the organism breeds and is hereditary in the *Ornithodoros moubata* in Africa and this is probably the case in the louse elsewhere, but the findings of various observers are not quite consistent (23), (29), (31). Leishman (34) has reported a 'granule clump' formation by the spirillum in the *Ornithodoros moubata*, a sort of spore formation, and J. Koch (29) a somewhat similar appearance in the louse.

THE CLINICAL COURSE OF THE DISEASE

The incubation period—In this epidemic I had no indications of the length of the incubation period. It is usually given as from 2-10 days (11), (23), (47), but Manson and Thornton found about 7-14 days the usual time with variations from 2 to 17 (13).

THE INFLUENCE OF SEX

In our epidemic only one case occurred in a woman to 65 in men, but this was nearly the proportion of women to men in the section

Other observers agree that males are much more frequently attacked than females (1), (2), (47)

ONSET

The onset was always sudden, without premonitory symptoms, the temperature rising to 39-40 degrees C in about 12 hours. In the majority of cases the temperature rose in the evening or at night, and rigors were notably absent in distinction from malaria. The usual symptoms due to fever were observed. When first seen, usually on the first or second day, the patients had a peculiar lethargic manner. They were very docile, and rather slow in their movements, and seemed as if weighed down by terrible trouble. They did not (as was often the case with other diseases) try to impress the doctor by the seriousness of their illness. I thought their manner rather characteristic, and that I could usually decide if a patient had this disease or not when he first walked into hospital. I have since found that other observers have noticed a similar manner (13), and Bertier in Serbia (11) and Van Hoof in Africa (3) consider it characteristic. Portcalls in Salonika (4) notes a curious cry, as in meningitis, but with us this symptom was not present. This observer also notes that Kernig's sign often occurs.

HEADACHE

Headache was invariably present, and perhaps, as various observers think (4), (9), more severe than one would expect to be associated with the rise in temperature.

DELIRIUM

Delirium was only present in the one fatal case, and then only late in the attack, and of the low muttering type. This symptom appears to have varied much in different outbreaks. Some observers (16) consider early delirium an important diagnostic sign. While others (4), (17) are aided in diagnosing their cases by the absence of it.

THE TONGUE AND BOWELS

The tongue was usually furred and moist and seldom the dark brown, dry, furred tongue one often sees in typhus. In some cases it remained clean until the third or fourth day of the attack.

The bowels were generally normal, but constipation was more common than diarrhoea.

EPISTAXIS

Epistaxis in the initial stages was only observed in one case. In some outbreaks this has been noted as a common symptom [Vide (4), (11), and contra (13)].

VOMITING

Vomiting was rare as opposed to Vandyke Carter (1) and others.

RASH

A rash was never noticed, and most observers agree in this. It is difficult to see a rash in a patient covered with louse-bites, as most of our cases were, and though Vandyke Carter, the most

careful observer of the disease, has described one, it is, at any rate, not at all an obvious sign.

THE LIVER

The liver was enlarged at the beginning of the attack in one case, the enlargement subsequently disappearing. This initial enlargement has also been noticed by v Hoesslin (9).

Jaundice occurred in one case without enlargement of the liver. Various observers have described a clinical type of the disease in which jaundice is a prominent symptom, and our jaundiced case fits in fairly well with this so-called 'bilious typhus type' [Vide McCowan (14)].

THE SPLEEN

The spleen was enlarged in 30 per cent of our cases. Many observers agree that this organ enlarges progressively during the periods of fever and diminishes again during the intervals [Vide (7), (9), (47), and contra (13)]. There is no doubt that in most outbreaks this organ is frequently enlarged, but in the epidemic in E. Africa in 1917-18 (13), and in Macedonia in 1917 (5), this does not appear to have been the case, and Delille (5) and others consider that in this latter outbreak an enlargement of the spleen indicated concurrent malaria. In the section until the relapsing fever was over we had very little malaria. It is noteworthy that in our one fatal case the spleen was *not* enlarged, and this case was of the bilious typhus type in which McCowan says it is always enlarged (14).

A case of spontaneous rupture of the spleen on the fifth day is on record (15).

JOINT AND MUSCLE PAINS

These were complained of in 21 per cent of our cases, but generally not until after the temperature had fallen as a result of treatment with neosalvarsan. In most outbreaks they are noted as common symptoms and some observers think they are important diagnostic signs (4), (9).

HEART AND CIRCULATORY SYMPTOMS

Beyond an increased pulse rate in proportion to the fever these symptoms were not observed. Okuniewski (20) has noted that there is no obvious change in blood pressure in this disease.

NUMBER OF DAYS

Number of case	1	2	3	9	11	13	45	46	64
1st period of fever	8	?	7	7	5	5	7	7	8
1st interval	5	8	8	30		12	6	?	5
1st relapse	5						?		
2nd interval	8								
2nd relapse	4								
3rd interval	13								
3rd relapse	2								
4th interval	16								
4th relapse	1								

I have neglected this figure in the average as I think it probable that this patient, an extraordinary Russian, had a relapse, and did not appear at hospital. He only came to hospital on the last day of his first attack and then stayed but one day.

THE RELAPSES

The attack of fever, with some or all the above symptoms in the few of our cases where it was not cut short by neosalvarsan, lasted from five to eight days (average from 61). The fever then fell by crisis as suddenly as it had risen, often to below normal. Great sweating generally accompanied the fall of temperature, and the symptoms in favourable cases were rapidly ameliorated. After an interval of from 5-12 days (average 68) without fever, another attack generally occurred very similar in its onset and symptoms to the first but generally of shorter duration. In the one case that was carefully observed through four relapses, the periods of fever became shorter, and the intervals longer with each relapse.

The lengths of the periods of fever and intervals of the eight of our cases which had at least one period of fever uninterrupted by neosalvarsan are shown in the table above.

COMPARISON OF OUR OUTBREAK WITH OTHERS

In the duration of the attacks and intervals, as well as in the symptoms our cases agree well enough with the classical description of the disease by Vandyke Carter, and with most subsequent observers (4), (11), (12), (9).

In the outbreak in Serbia in 1916-17 (6), (7), however the attacks were shorter (3-3½ days, rarely 4 days) and this outbreak seems to have been altogether of a milder character—more than one relapse occurring but very rarely, and the mortality being practically nil.

The differences between our outbreak and the African one described by Manson and Thornton (13) are discussed below.

THE DISEASE AS MODIFIED BY NEOSALVARSAN

After the administration of neosalvarsan the course of the disease is modified and as in almost all cases this or a similar drug would be given as soon as the disease was diagnosed it is this modified disease which is of the most interest.

On the administration of neosalvarsan the temperature does not fall until from 12 to 36 hours later (average 22 hours, one case took 48 hours and one 72 hours), and then by crisis. In the cases which subsequently relapsed the time taken for the temperature to fall was longer than in those which were cured by one dose (25.3 hours against 20 hours). In these cases also, the time taken for the temperature to fall after the second dose of neosalvarsan was longer than normal (average 27.4 hours), and this seems to indicate that these cases were less reactive to the drug. On the fall of the temperature the other symptoms were in favourable cases, all rapidly ameliorated, and the patient was fit to go out of hospital in 3 to 5 days.

In three cases the temperature rose again 2-4 days after the neosalvarsan, but spirilla were not found in the blood. In two of these cases it remained up for two days and the patients then made a good recovery, but in one case it

remained up for six days, until the patient died in a typhoid-like stage. Vandyke Carter has noticed a similar rise of temperature, without spirilla in the blood in some cases during the first interval.

SYMPTOMS OCCURRING AFTER NEOSALVARSAN

I was unable to determine certainly how far the symptoms occurring after neosalvarsan were due to the disease or to the drug. They were however, such as have been noted as common in cases of this disease which did not have this drug. The chief were severe headache from 2-4 days after the injection (31 per cent) and pains in the joints and muscles (21 per cent). In one case there was actual swelling of a joint (the left wrist).

Epistaxis occurred in 6 per cent of the cases and deafness or pain in the ear in 8 per cent [Noted as a common symptom by Toyota (12) and v. Hoesslin (9)]. Vomiting, irregular pulse, and giddiness occurred in one case each.

RELAPSES AFTER NEOSALVARSAN

In the cases which relapsed after a dose of neosalvarsan, the relapse was much delayed, to from 14 to 30 days (average 19.0 days). During the interval after their recovery from the first attack (average 4.6 days) they were apparently quite fit until the relapse, which was similar in its onset to the original attack. In the one case which had a second relapse after two doses of neosalvarsan, each interval was 24 days.

In view of the long interval, it is quite possible that these relapses were really re-infections. Various observers have stated that little or no immunity is conferred by an attack.

The prolongation of the intervals after arsenobenzene compounds has also been noticed by Manson and Thornton (13) and Portocalis (41).

THE ONE FATAL CASE

In the 66 cases only one death occurred $\frac{1}{66} = 1.5\%$, and this case presented some unusual features, which it may be of interest to describe shortly.

The patient was an Indian Mahomedan prisoner of war who was sent into the headquarters hospital from a small working party, some 30 miles away, across a waterless desert. A film of his blood had been examined, and found to contain spirilla, four days before the patient himself arrived. On admission his temperature was 38.2°C and he gave a history of nine days' fever. He was very weak, his tongue was dry and furred, and he was deeply jaundiced. His spleen was *not* enlarged. At the time of his admission his blood did not contain spirilla, but he was given a dose of 0.3 gr neosalvarsan intravenously. His temperature fell in 12 hours but very collapsed he was. On the third day the fever returned, and he remained in a typhoid-like state for six days until he died. Five days before his death he developed a painful inflammatory swelling of his left

parotid—a symptom noted by Vandyke Carter in 2 to 3 per cent of his cases

This case is similar to the 'bilious relapsing fever' described by McCowan (14) and others

COMPLICATIONS AND SEQUELÆ

Our cases showed very few complications or sequelæ, possibly owing to the early employment of neosalvarsan. One case of facial paralysis occurred, and one case each of bronchitis and conjunctivitis, but it is impossible to determine whether these were coincident accidents or not. Facial paralysis has been noted as 'common' in this disease by De Ruddere (42).

Other observers have recorded numerous complications particularly of the nervous system, both psychosis (19) and paralysis (18) and meningitis (3). Bronchitis was a common complication in E. Africa in 1916 (13).

ASSOCIATION WITH OTHER DISEASES

Both typhus and malaria are often associated with this disease. Typhus one would expect since it also is louse-carried and occurs under similar conditions. At Tel Hadî we had no typhus, but in other parts of Turkey I am fairly certain that the two diseases occurred simultaneously, and cases of relapsing fever were diagnosed 'atypical typhus,' for if such an outbreak occurs it is not easy to distinguish the two without a microscope. An outbreak of either means that conditions are ripe for the spread of the other and its concurrence should be watched for.

Three of our cases had concurrent malaria, about the proportion to be expected from the incidence of the latter disease. The clinical picture is confused by superadded malaria, and some French writers (5), (6), (7) have divided their cases into three classes, according as malaria is absent, coincides with, or follows the relapsing fever. Duchamp (28) even suggests there is a sort of symbiosis of the two parasites. With a microscope the differentiation is easy.

DIAGNOSIS

With a microscope diagnosis is easy and certain during the attacks, with the proviso that the spirilla are sometimes not to be found continuously throughout the periods of fever.

If the case is first seen after the initial attack is over, diagnosis is not generally possible until a relapse occurs. Van Hoof (3) in E. Africa has found that during this disease there is a leucocytosis of myelocytes and large mononuclears and a corresponding relative diminution of polymorphonuclears and small mononuclears, and suggests this can be used as an aid to diagnosis during the intervals when the spirillum cannot be found.

Without a microscope, however, the disease can rarely be diagnosed with any certainty until the first relapse, and an outbreak of this disease demonstrates very well how soon the cost of providing a bacteriological outfit is repaid in the lessened amount of sickness. This point is not

always conceded even in England, by the layman. In Turkey, and I think often in Germany, a microscope is looked on as an unnecessary luxury except for great bacteriological experts.

TREATMENT

There is only one form of treatment worth considering—the administration of an arseno-benzene which has a specific action on the spirillum. Obviously while the fever is high, the patient must be kept in bed, on a light diet, the bowels must be attended to, the headache may be treated with pyramidon and so forth, but the crux of the matter is—which and how much of the arseno-benzene compounds should be given and by which route?

The best route is undoubtedly direct into a vein. In three of our cases neosalvarsan was injected intramuscularly into the buttock, but it was found that this gave rise to very severe pain at the time of injection and inflammation afterwards. None of the cases actually developed an abscess which had to be opened, but one case appeared very nearly to do so. In the cases treated by intravenous injection, with the technique adopted, no cases of the slightest local inflammation occurred and the pain was limited to the prick of the needle.

As other observers (43) have recorded local trouble after intravenous injections of concentrated neosalvarsan, and I have never come across a technique quite similar to the one adopted, I venture to give it at length.

THE TECHNIQUE ADOPTED FOR INTRAVENOUS INJECTIONS OF NEOSALVARSAN

The patient is given a strong purge, time is allowed for it to act, and if necessary the purge is followed by an enema. He is given no food for four hours before injection.

Two hypodermic syringes, one at least of 10 c.c., and two interchangeable needles are boiled in a clean saucepan in distilled water. The tube of neosalvarsan is scratched with a file and rubbed over with alcohol.

Meanwhile the patient is laid flat on a couch, his arm bared to the shoulder, the hollow of the elbow painted all over with iodine, and a piece of bandage tied round the upper arm tight enough to compress the veins. If the veins are indistinct one or two suitable ones are marked with indelible pencil before painting with iodine.

The operator washes and disinfects his hands as for an operation, fits together the two syringes, and draws up about 3 c.c. of the boiled, and still hot, distilled water into the 10 c.c. one. He breaks the neck of the neosalvarsan tube, and squirts the 3 c.c. of water in. The neosalvarsan dissolves at once, and is drawn up into the syringe, and distilled water drawn up till the total bulk is 6 c.c. Any air is expelled and this syringe placed ready across the saucepan.

The operator now takes the other syringe and pushes it through the skin of the patient into, and a little way along inside, a vein, drawing

up some blood to make sure he is properly in it he should, by accident go through the vein and out the other side, as shown by a rapidly increasing local swelling, the syringe should be at once withdrawn and the operation restarted on another vein

The needle being properly in, the bandage round the upper arm is loosened and the needle is left in its place while the syringe with the solution of neosalvarsan is substituted for the other syringe. Should a drop be spilt in the process it is immediately mopped up.

The neosalvarsan is now injected slowly and steadily at about the rate of 1 cc per minute, and when the injection is complete before removing the needle, a few cc of blood are drawn up and returned two or three times to wash out any residual neosalvarsan in the syringe or needle. The syringe is then depressed so that the side of the vein comes against the hole at the end of the needle, and the piston again withdrawn so that a partial vacuum is created inside and the syringe and needle then quickly withdrawn. By this means, a trace of neosalvarsan, if still left inside the needle, is sucked inside the syringe during withdrawal, and not left in the tissues of the arm. It is not difficult to do.

A drop of collodion is put on the wound and a pad of wool. The patient is kept lying flat on the couch for at least one hour, and is then taken away on a stretcher, put to bed, and kept on milk diet until the temperature falls.

By this technique none of the neosalvarsan can come in contact with the subcutaneous tissues of the arm. It should be remembered that any blood left in the syringes or on the patient's arm is infectious, and steps must be taken to destroy the organisms in it.

THE DOSAGE

The conclusion arrived at from observations in this outbreak was, that 0.45 gram neosalvarsan intravenously was the best dose.

In 30 cases 0.3 gram was given, and in eight of these cases subsequent relapses necessitated a further dose of 0.3 gram, and in one case two further doses. Amongst those 20 cases that had 0.45 gram in the first place, no relapses occurred. Some observers (3), (13), (42) have noted that neosalvarsan is more effective if given in the first attack, and we were fortunate in that respect in seeing our cases early—only three cases being treated with intravenous neosalvarsan for the first time during a relapse. Of these cases one had 0.45 gram and two 0.3, and none of them relapsed.

Patients suffering from this disease are said not to bear large doses of neosalvarsan well, and it is desirable that only just an adequate dose should be given.

The average time in hospital, after receiving an injection, of those that received 0.45 was 3.2 days, against 4.3 days in the first case of those

who had 0.3 gram, and a subsequent 6.25 days in the eight that relapsed.

The average time in hospital of the three cases who did not receive neosalvarsan, but who were not lost sight of, was 40.6 days, and of the 58 cases who received it either intravenously or intramuscularly was 6.8 days.

A table showing the results of treatment

Number of cases	Attack	Dose of 914	Hours for temp to fall	Days in hospital after injection	
20 1st		0.45	19.8	3.15	} No relapses
1 2nd		0.45	24	4	
20 1st		0.3	19.2	4.2	
6 1st		0.3	30	5.5	} Relapsed & given another 0.3 gram
1 1st		0.3	24	7	
1 1st		0.2	12	3	No relapse (a boy)
2 1st		0.3 twice			No relapse
1 During interval		0.3	Died 9 days later		
1 1st		0.3 into buttock	12	3	No relapse
1 1st		0.45 into buttock	12	31	One short relapse
2 1st		do	12	9	Relapsed and was given 0.3 intravenously. Good recovery

ON THE USE OF OTHER DRUGS THAN NEOSALVARSAN

In the treatment of our outbreak, neosalvarsan was the only one of the various arseno-benzene compounds tried because it was the only one we had but from the number of papers (11) (40), (42) (43), (44), (46) I have since found, written to show other drugs are just as good as neosalvarsan, I gather that the latter drug is the best.

It is often stated (21), (50) that neosalvarsan does not work so well in this disease in Africa as elsewhere [Hegler (10) says the same thing of Palestine] and the Belgian doctors in E. Africa recommended 'Satoxyl'* in preference to it. Manson and Thornton have however, concluded after a very careful trial of many drugs, including satoxyl, that novarsenobillon is the best. I have not been able to discover what, if any, is the difference between this and neosalvarsan.

Of the drugs other than arseno-benzene compounds, Arrhenal (di-sodium-methyl-arsenate) is the only one I can find reported to have much effect, and this is recommended as a substitute for neosalvarsan, when the latter is difficult to obtain, by Dumitresco-Mante (46).

* Satoxyl is —

Atoxyl	10 grammes	} Dose 3-4 c.c. intramuscularly twice weekly
Mercury Perchl	0.3 gram	
Pot iodide	2.5 gram	
Water	to 100 c.c.	

Serum treatment has not so far given very good results (41)

PROPHYLAXIS

The obvious prophylactic measure is to kill the vectors—in this outbreak, lice,—and the most important fact in devising schemes to this end is that lice and their eggs are easily killed by a comparatively low degree of dry heat [55°C for 30 minutes or 60°C for 15 minutes (50)]

In ordinary civil life, if one keeps oneself reasonably clean, one does not get lice, and the ordinary sanitary measures in such a country as England are quite a sufficient prophylaxis against the spread of this disease, but with troops under war conditions it is different, and during the war many elaborate and excellent schemes for de-lousing (according to Nuttall the word should be 'lousing') the troops were devised. These vary with the means at one's disposal, and to go into the matter is beyond the scope of this paper.

In the Tel Hadı hospital, our method, which proved quite effectual was, shortly —

Each patient on admission was deprived of all his clothes, shaved of all hair, and given a hot bath with soap. He then, when clean, was supplied with clean hospital clothing and clean bedding, and his own clothes, after being baked in a dry heat of more than 60°C for 15 minutes, were stored till he left the hospital.

All the hospital mattresses, bedding, linen, etc., were regularly baked in rotation. The clothing of the hospital staff was baked about once a fortnight, or oftener if any of them found lice in their things.

The floors of the hospital were washed or sprinkled with a suspension of chloride of lime in water.

Unfortunately, chiefly owing to the scarcity of fuel, we could not extend such a scheme to all the inhabitants of the section.

The heat of a tropical midday sun is quite sufficient to kill lice, and Wanhill (51) has dealt successfully with an outbreak of relapsing fever by moving the troops attacked out into camp on the banks of a river where they could wash themselves and their clothing and use the sun to destroy the lice and eggs. The lice in the houses occupied were left to starve, which they soon do if deprived of animals to feed on.

As remarked above, any blood, and possibly other fluids, coming from a relapsing fever patient, during the fever at any rate, is very infectious and must be destroyed. Scratching should be avoided, both by the prospective patient to allay irritation, and by the barber when shaving. As bedbugs can carry the disease these should also be dealt with.

In Africa, against *Ornithodoros moubata*, prophylaxis consists in personal precautions at night when the ticks feed, and disinfection of the tick-infected houses [Vide (50), page 218, etc.]

APPENDIX

As an appendix I have added three notes —

- (1) On the invasion of tissues other than the blood by the spirillum,
 - (2) On the mortality in other outbreaks,
 - (3) On the varieties of relapsing fever,
- and a list of authorities quoted in the paper, with short notes to indicate the nature of the book or paper, arranged under the following headings —

- (1) General accounts of outbreaks
- (2) On special types of the disease, etc
- (3) On the spirillum and the vector
- (4) On the treatment
- (5) Accounts of the disease in text-books, etc

ON THE INVASION OF OTHER TISSUES THAN THE BLOOD BY THE SPIRILLUM

The invasion of tissues other than the blood by the spirilla has occasionally been reported. Brault and Montpelier (25) have found it in the sweat and tears, and perhaps in the cerebro-spinal fluid. Two other observers (4), (13), however, agree, that it is never present in this latter fluid, even in cases showing cerebral or meningeal symptoms.

Its presence in the urine too is very doubtful. Dudgeon (27) found a spirillum in 30 per cent of the urines of a series of relapsing fever cases. But Stoddard found that 46 per cent of the urines of healthy subjects treated similarly showed spirilla. Manson and Thornton (13) never found it in the urine, nor according to them does it seem to be present in the sputum unless contaminated by blood.

ON THE MORTALITY IN OTHER OUTBREAKS

The mortality in this disease, which used to be called 'famine fever,' is no doubt influenced by the often added condition of semi-starvation of the patients. It shows, however, I think, a tendency to decline, due perhaps to the introduction of treatment by arseno-benzene compounds.

Vandyke Carter's mortality was 18.02 per cent and in many of the outbreaks before his time was even higher, up to 50 per cent. In recent outbreaks it has varied from nothing or very little in Servia in 1916 (6), and Macedonia in 1916-17 (4), (5), and E. Africa in 1917-18 (13) to 8 per cent in Manchuria in 1918 (12) and 17.18 per cent in Albania in 1916 (8).

ON THE VARIETIES OF RELAPSING FEVER

Clinical varieties — It is usually considered that there are at any rate two varieties of relapsing fever, the European and the African—the disease as seen in India, America and as recently described in Manchuria (12) not being essentially different from the European variety.

A very excellent account of the disease as seen in E. Africa, from observations on no less than 1,500 cases, has recently been published by

ON AN OUTBREAK OF RELAPSING FEVER IN TURKEY IN 1918

BY CAPTAIN CLIVE NEWCOMB, M D (Oxon), A I C, I M S,

Officiating Chemical Examiner to the Government of the Punjab

									Turk	Turk										
10									Turk	Turk										
9																				
8					Turk			Turk		Russ	Turk									
7					Turk	Turk		Turk		Russ	Turk									
6					Russ.	Russ	Greek	Turk		Chekas	Turk									
5					Russ	Russ	Greek	Russ		Arm	Greek	Turk								
4					Greek	Chekas	Greek	Russ		Arm	Greek	Ind	Turk							
3				Turk	Greek	Chekas	Chekas	Greek		Arab	Ind	Arm	Greek	Arm						
2				Russ.	Chekas	Arm	Chekas	Ind		Eg	Ind	Arm	Ind	Arab						
1		Ind	Ind	Russ	Chekas	Aig	Aig	Chekas		Maroc	Kurd	Germ	Ind	Arab						
	1	7	14	21	28	5	12	19	26	2	9	16	23	7	14					
	APRIL				MAY				JUNE				JULY							

Manson and Thornton (13) The resemblance between this disease and the European or Indian variety are much more striking than the differences and there is hardly a feature in this description that cannot be matched in some outbreak or other in other continents

The differences—In the African disease, the temperature remains up in the first attack for a variable period, 'usually for three days' [(13), page 107], and in subsequent attacks for but two days or less (Precise details are wanting) This is the period given in the outbreak amongst the Serbs in 1916-17 (6) (7), but the rule in the European variety is 5-7 days Vandyke Carter reckons an average of seven days for the first attack, but says this figure is probably too big, as the patients in giving their histories were prone to exaggerate the length of their illness before appearing at hospital

The number of relapses in Africa amongst the W African natives living in E Africa is ordinarily five and up to eleven Amongst the E African natives the relapses are as a rule fewer (in 30 per cent none at all), but up to nine have been observed In other continents more than four hardly ever occur The latter ones of these numerous relapses in the African variety are rises of temperature to from 99 to 100 degrees F for a few hours, and consequently would in all probability be overlooked unless the patients were under very careful observation That they were true relapses is shown both by their regular periodicity, and by the appearance of spirilla in the blood

In Africa the common vector is the *Ornithodoros moubata* and in other continents the louse Although lice were prevalent in E Africa, Manson and Thornton bring some evidence that they never carried the disease there, but the evidence is not conclusive As Toyota remarks the *Ornithodoros* can carry the disease if introduced into other countries, and other animals, *e.g.*, the bed-bug can, and probably do, sometimes carry it

Manson and Thornton found that spirilla were most plentiful in the blood at the beginning of the attacks and often disappeared towards the end This is directly opposed to observations in other continents, where the maximum number of spirilla in the blood is not reached before the third day of the fever

The observation of various previous workers (21), (50), that the African variety does not react so well to arseno-benzenes is not confirmed by Manson and Thornton

Differences in the parasite—Four varieties of the parasite are often described, the *Sp Obermeieri* in Europe, the *Sp Carteri* in India, the *Sp Duttoni* in Africa, and the *Sp Novyi* in America, chiefly owing to a paper by Novy and Knapp (22) in which this division was advocated Both morphological and serum reaction differences have been described in the parasites and differences in the clinical diseases they produce.

The clinical differences have just been dealt with

Nuttall (23) and Bayon (24) in 1912, Macfie and Yorke (26) in 1917, and Toyota (12) in 1919 have all concluded that there are no recognisable morphological differences between organisms from different parts of the world

The serum reaction differences are by no means clear and precise and various observers do not agree at all amongst themselves as to them Toyota (12), after a long and careful research, thinks that the so-called species can be transmitted by prolonged passage through animals I think this observer (who although he writes in that language is not a German) comes to a safe conclusion in saying "Es ist unserem jetzigen Wissen nach unmöglich die Rekurrenssporiochaeten in verschiedene Arten einzuteilen"

GENERAL ACCOUNTS OF OUTBREAKS

- (1) Vandyke Carter, H
Spirillum fever London, 1882
A large book of 450 pages, devoted to a most careful and detailed description of the disease as seen in Bombay in 1877-80
Sir Leonard Rogers refers to it as the classical account of the disease
- (2) Walker, E A
Spirillum Fever in India I M S Gazette, 1905, p 320
Only a letter with some details, from memory, of an outbreak on the North West Frontier
- (3) Van Hoof, L
Note préliminaire sur la fièvre récurrente parmi les troupes dans l'Est Afrique Allemande Bull Soc Path Exot, Paris, 1917, x, pp 786-791
A clinical description of an outbreak in East Africa
- (4) Portocalis, A
Sur l'épidémie de la fièvre récurrente observée récemment en Macédoine Bull et Mém Soc Méd, d'Hôp de Paris, 1917, 3, s xli, p 780
A clinical description of the outbreak amongst the Greeks in Macedonia in 1916-17 (800 cases)
- (5) Armand Deblille, P Garsin and Lemaire, H
Les principaux caractères de la fièvre récurrente à l'armée d'Orient Bull et Mém Soc Méd, d'Hôp de Paris, 1917, 3, s xli, pp 778-780
A clinical description of a small outbreak amongst the French troops in Salonika in 1916-17 (50 cases)
- (6) Duchamp, C J
Contribution à la pathologie des Balkans La fièvre récurrente des Serbes Bull Acad de Méd Paris, 1917, 3, s lxxvii, p 372
A clinical description of the disease amongst the Serbs in 1916
- (7) Duchamp
La fièvre récurrente chez les Serbes Prog Méd, Paris, 1917, 3, s xxxii, 10-12
A clinical description of an outbreak in Servia 1916-17 (71 cases)
- (8) Weiner, E
Ueber eine Rekurrensepäpidemie Méd Klin, Berlin, 1917, xiii, p 1043
A description of an outbreak in Albania in 1916-17 The statements are often very vague and statistical details are wanting
- (9) Von Hoesslin H
Zur Klinik des Rückfallfiebers Münch Med Wochsch, 1917, lxxiv, pp 1065 & 1106
A long paper with a very full clinical description of the disease. The therapy is not well treated of

- (10) Hegler
Erfahrungen über Febris recurrens Wein Klin Wochsch, in Palästina 1917, xxx, p 547
A short report of a medical meeting and discussion. One of the speakers a Dr Apostolides gives shortly clinical details of more than 950 cases he had had in Palestine
- (11) Bertois
La fièvre récurrente Jour de Med et Clin prat, Paris, 1918, lxxxv, pp 932-946
A general description of the European variety of the disease, clinical and pathological. The world distribution is dealt with at length.
- (12) Toyota, H
Studien über die Recurrens spirochaeten in Mandchurien Kitasato, Arch Ex per Med, Tokio, 1919, pp 43-84
A long and careful paper describing—
(1) Various experiments on the inoculation of spirilla into animals, and serum reactions
(2) The clinical features of an outbreak in Manchuria (70 cases)
- (13) Manson, J K & Thornton, L H D R A M C Journal, East African Relapsing Fever 1919, August, pp 97-116, Sept, pp 193-216
A long and very good account of the disease in East Africa (1,500 cases)
- ON SPECIAL TYPES OF THE DISEASE, etc
- (14) McCowan W T
Bilious typhus and relapsing fever I M S Gazette, 1906, pp 387-396
A detailed clinical account of the bilious typhus type of the disease
- (15) Jansug & Jurinec
Ueber einen Fall von Milzruptur bei Febris recurrens Wiener Klin Wochsch, 1917, xxx, p 1651
- (16) Porat, A
Délire et réactions psychomotrices dans la fièvre récurrente de l'Inde Bull Soc Path Exot, Paris, 1917, v, pp 532-536
On early delirium as a prominent symptom in N Africa
- (17) Parrot, L
Du délire et des réactions psychomotrices dans la fièvre récurrente algérienne Bull Soc Path Exot Paris 1917, x, pp 692-694
On the absence of delirium in N Africa
- (18) Yacoub, K
Spirochaetal dysentery and post spirochaetal paralyses during an epidemic of relapsing fever Practitioner, Lond 1917, xcix, pp 487-491
A good paper, clear, short, and to the point
- (19) André Thomas, Loygue & Levy Vallens, J
Accidents nouveaux au cours du typhus récurrent considérations sur l'ataxie aiguë Rev neurol, Paris 1918, xxx, pp 216-220
Only one case
- (20) Sterling Okuniewski, S
Blutdruck im Verlaufe von Rückfallfieber Deut Med Wochsch, 1918, p 265
Concludes—'Es wird also im Laufe von Rückfallfieber meist kein deutlicher Einfluss der Krankheit auf den Blutdruck beobachtet'
- (21) Redford, J H & Duke, H L
A case of Spirillum fever in (German) East Africa R A M C Journal, 1919, Jan, pp 78-81
- ON THE SPIRILLUM AND VECTOR
- (22) Novy, F G & Knapp, R S
Studies on *Sp. Obermeieri* and related organisms Jour Infect Dis cases 1906, Vol III, pp 291-303
A paper of over 100 pages and mainly responsible for the division of relapsing fever spirilla into the four species
- (23) Nuttall, G H F
Herter Lectures, 1912 I Spirochaetosis Parisitology, 1912, Vol v, pp 262-274
A very good summary of the evidence for the louse as the vector. The author concludes that there is only one species of *Sp. recurrentis*. Some interesting notes are given on the life history of the louse from experiments
- (24) Bayou, H
Experimental transmission of the spirilla of European relapsing fever to rats and mice Ibid, p 135
Concludes that there is no morphological difference between *Sp. recurrentis*, *Sp. Duttoni* and *Sp. Novyi*
- (25) Brault, J & Montpellier, J
Note sur la présence du spirille de la fièvre récurrente en Nord Afrique dans quelques liquides et excréta de l'économie Bull Soc Path Exot, 1914, Vol VII, p 472
The 'liquides et excréta' are the cerebro spinal fluid, the sweat and the tears
- (26) Macfie, J W S & Yorke, W
The relapsing fever spirochaetes Ann Trop Med & Parasitol, Liver pool, 1917, vi, 81-85
Concludes that there is no morphological difference between the various species of *Sp. recurrentis*
- (27) Dudgeon, L S
Examination of the urines in cases of relapsing fever occurring in Macedonia Lancet, London, 1917, ii, pp 823-825
The author found spirilla in 27 out of 82 cases, but it is probable that these were not *Sp. recur.*
- (28) Duchamp, C J
Fièvre récurrente Presse Med, Paris, 1917, xxx, 210
Suggests a symbiosis of the *Sp. recurrentis* and the malaria parasite
- (29) Koch, J
Zur Uebertragung des Erregers des europäischen Rückfallfiebers durch die Kleiderlaus Deut Med Wochsch, 1917, xlv, pp 1066-1094
The author thinks the spirilla breed in the louse and gives good microphotographs of clusters of spirilla somewhat resembling those found by Laeshman (v 134)
- (30) Mayer, M
Die Uebertragung des Rekurrens durch Lause Munch Med Wochsch, 1917, lxxv, 70
- (31) Mayer, M
Zur Uebertragung des Erregers des europäischen Rückfallfiebers durch die Kleiderlaus Deut Med Wochsch, 1917, xlv, p 1231
The author doubts the breeding of spirilla in the louse
- (32) Wiese, O
Zur Uebertragung des Rückfallfiebers Deut Med Wochsch, 1918, pp 60-62
Implicating the *P. Capitis* and *P. pubis* as well as the *P. Vestimentorum* as European carriers

- (33) Töpfer, H
Zur Uebertragung des Erregers des Deut Med
europäischen Rückfallfiebers Wochsch, 1918,
durch die Kleiderlaus p 230
- (34) Leishman, Sir W B
A note on the "granule clumps" Ann de l'Inst,
found in ornithodoros moubata Pasteur Paris
and their relation to the spirilla 1918, xxii, 49-
of African relapsing fever 59
A short paper These 'granule
clumps' seem to be functionally
at any rate a kind of spore form
ation
- (35) Lloyd, Ll
Louse and their menace to man Oxford Med Publ
1919 (Relapsing
fever, p 100)
A treatise on the habits and life of
the louse

ON THE TREATMENT

- (36) Inversen Ueber die Wirkung des Munch Med
neuen Arsenpräparates Erlich bei Wochsch, 1910,
Rekurrens No 5
52 cases with four relapses
- (37) Smiroff Die Anwendung der Sal Deut Med Wochsch,
varsan bei febris recurrens 18, Ap 1912
201 cases with 17 relapses
- (38) Conseil, E & Bienarsis, E
Traitement de la fièvre récurrente Bul Soc Path
par le n eosalvarsan d'Erlich Exot, 1912, Vol
V, p 476
On the advantage of neosalvarsan
over salvarsan
- (39) Foley, H & Violette, C
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REFERENCE TO ARSENO BENZENE COMPOUNDS
IN THE TREATMENT OF RELAPSING FEVER

SALVARSAN	(13),	(36),	(37),	(38)
NEOSALVARSAN	(13),	(38),	(39),	(40), (45)
ARSALYTS	(bis methylamino tetramino arseno benzol)	(43),	(44)	
OLARSOL	(? composition)	(39)		
LUDYL	(Phenyl-disulph amino tetraoxy diamene diarseno benzene)	(40)		
GALYL	(Tetra oxy diphosphamino diarseno benzene)	(11), (13), (40), (41)		
ATOXYL	(Sodium amino arsenate)	(13)		
SATOXYL	(v, p 21)	(13)	(42)	

NOTES ON INFLUENZA

By J H McDONALD,

LIEUT-COLONEL, I M S,

DURING the winter of 1918-19, the bacteriological examination of sputa in cases showing influenzal symptoms revealed the almost invariable presence in large numbers of a Gram-negative cocco-bacillus,—an organism not found prior to this in pneumonic conditions in Abbottabad The cultivation of this proved it to be the col type of the Friedländer group In the face of general opinion it was difficult to associate this with the epidemic then prevailing, but the fact that in five cases this organism was obtained in pure culture from pleuritic effusions naturally raised a doubt, which could not be removed by further observations owing to the cessation of the disease During this last winter, noting again the predominance of this cocco-bacillus, I carried out observations in connexion with over 200 cases which have forced me to the conclusion that this organism is playing a great, if not the chief, part in the present epidemic for the following reasons —

1 Its invariable predominance in the sputa of nearly all (95 per cent) laryngeal and pneumonic cases and its presence almost in pure culture in over 40 per cent of the cases

2 The total absence of any organism like the influenza bacillus or pneumococcus even on repeated examinations of sputum from the same case and entire failure to obtain evidence of either even on selective media

3 Its highly pathogenic properties— $\frac{1}{2}$ c.c. of a broth emulsion injected under the skin being a lethal dose for a quail or pigeon with death in 8 to 12 hours, and 5 c.c. for a rabbit or guinea-pig proving fatal in 18 to 24 hours. The organs show all the signs of acute septicæmic poisoning and the cocco-bacillus is found in, and can be cultivated from, the blood

Morphology—Its pleomorphism is evident in both sputum and cultures

In cultures its variations are dependent on the medium and on the cultures being primary or secondary. The following table shows the development according to these factors —

A	B	C
Medium	Primary Culture	Secondary Culture
(1) Blood Agar	Short stout cocco bacilli with forms	Smaller cocci with more slender and frequently longer bacilli
(2) Ordinary Agar	Mainly coccal and diplococcal forms	All coccal forms.
(3) Broth	Mixed coccal, diplo coccal and bacillary forms	Similar
(4) Boiled white of egg	Mixed forms as in (3), but smaller and with but few bacillary forms	Mainly coccal and diplococcal
(5) Gelatine Slope	Seldom obtained and then showing only coccal forms	Nil
(6) Gelatine Stab	Growth scanty and limited to surface—chiefly coccal forms	Nil

Transference from (3) or (4) to (1) shows the same as C (1) usually and rarely B (1)

Cultural characteristics—The growths on various media correspond with those of Friedlander's pneumo-bacillus differing, however, in the following respects —

(1) Its growth on various media is by no means exuberant except in broth and sometimes on blood-agar and boiled egg-white. On ordinary agar and gelatine only the short stout cocco-bacillary form develops as a rule, and then scantily, showing mainly coccal forms. Even when extensively prevalent in sputum cultivations prove a failure

(2) Encapsulated forms are rarely seen in sputum or cultures unless the latter be passed through a bird or animal, when they become evident

(3) The lanceolate form is rarely seen, the bacillus being either an elongated coccal form or sausage-shaped. Except the diplococcal form pairing is seldom seen, the bacilli grouping themselves in palisade fashion

Relationship of germ to disease—A comparison between the conditions found clinically and bacteriological findings tends to strengthen the opinion that this cocco-bacillus plays a great, if not the chief, part in the causation of the

disease. The following table represents the comparative states —

Bacteriological	Clinical
1 Short stout cocco bacillary forms predominant	Symptoms very severe Septicæmic conditions marked, involvement of lung not proportionate Sputum thick and gangrenous (green and foul smelling)
2 Coccal and diplococcal forms predominant	Symptoms vary according to severity of infection Septicæmia as marked as (1) if infection severe sputum yellowish or yellowish green semi liquid with tinges of rust or bright coloured blood
3 Coccal forms only	Symptoms mild Septicæmia not marked Sputum yellowish and semi liquid

Mode of infection—Thus, as far one can see, is entirely through the respiratory system

Nature of infection—This appears to be a sapræmia more than a septicæmia for the following reasons —

(1) Repeated examinations of blood smears taken *ante mortem* from the peripheral circulation and *post mortem* from the heart and lungs show the presence of no organism, while at the same time the sputum may be swarming with them

(2) Cultures made from the blood, ante- and post-mortem, prove negative

(3) Cases clinically showing no pulmonary abnormality till the patient is moribund and then only a congestive condition, prove fatal from a pharyngeal or laryngeal affection the sputum alone exhibiting the presence of the cocco-bacillus in one of its forms

Chronic infections—From my observations it would appear that the existence of a chronic influenzal infection has not been fully realized. Cases not infrequently met with are considered, owing to the hectic nature of the temperature and signs of pulmonary disintegration or empyema, to be due to tubercular infection. Repeated examinations of the sputum reveal no tubercle bacilli but the presence in considerable quantity of the same micro-organism with staphylococci or streptococci. Sajous in his Encyclopedia points out the occurrence of such cases in pure influenzal affections and Besson in his Manual of Bacteriology shows the effects of mixed infections. We ought, then, to remember not only the possibility of such chronic conditions, but the dangers arising to the public by neglect of measures to prevent the spread of the disease for most people will keep clear of a patient acutely infected, but in ignorance will not avoid a chronic case

Treatment—Much has been written and said about gargles of various kinds. While not depreciating the value of these one is brought face to face with incontrovertible facts, showing how such useful information can prove a source of raillery for the misbeliever. The facts are these —

(1) What percentage of the Indian population will actually take the trouble to gargle

properly with any medicated solution even once a day? The very admixture of any such substance even in drinking water results in its total avoidance.

(2) Spirituous forms of medication

The penetrating power of spirits when inhaled makes these far more efficacious, and as inhalations they have, in my hands, proved more successful arresting the development of general symptoms it used at the initial stage. The combination of creosote or iodine with tinct benzoin co and rectified spirit acts rapidly and most effectively. The ease with which inhalation can be done by sprinkling the solution on a piece of lint makes it more acceptable to people generally.

A Mirror of Hospital Practice

IMPROVISED TRIPLE-BLADED BAMBOO GASTRO-ENTEROSTOMY CLAMPS

By KHURSHID HUSAIN, M.B., B.Ch. (Edin)

District Civil Surgeon, Raichur

I AM sending an account with a drawing and a sample of the "Improved Triple-bladed Bamboo Forceps," used successfully in Raichur Dispensary for posterior gastro-enterostomy operation.

to pyloric stricture, was waiting for operation. He was very uncomfortable, and was so inclined to commit suicide if not operated on, that on not receiving any instrument from Bombay I prepared a set of forceps from bamboo and performed the operation on 15th March, 1920 (11th Ardibakist 1329), and found the improvised triple-bladed bamboo forceps more handy and suitable. The diagram of it is given below in Fig 2.

Figure No 1 is Moynihan's triple-bladed stomach clamp and is metallic, blades of it are smooth and have no curve in them.

Figure No 2 is the improvised triple-bladed bamboo forceps. The following are its advantages —

1 It is easily available and prepared, as it is made up of only a piece of bamboo and needs only a knife to prepare it.

2 It is so cheap as not to cost even two dabs, whereas metallic triple-bladed forceps cost more than Rs 40.

3 It is sterilised well simply by boiling. Bamboo blades, I found, on boiling lose their rigidity and become more elastic and conveniently flexible which is especially needed. For the operation, as a precaution I had prepared four sets of forceps, one I sterilised by boiling others I sterilised by the application of tincture of iodine, spirit, carbolic acid, etc., but I found the forceps sterilised by boiling served the purpose well.

4 The tear in the bamboo gives a good and handy grip for holding the portions of

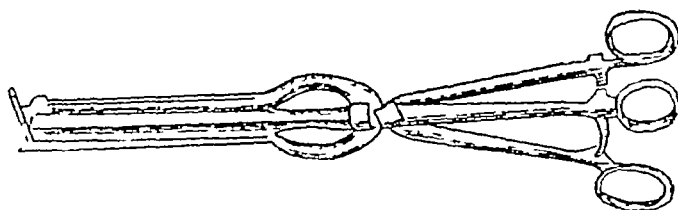


FIG 1 — Moynihan's Triple bladed Stomach Clamp

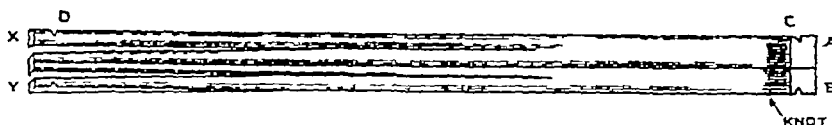


FIG 2.—Improved Triple bladed Bamboo Clamp for Gastro-enterostomy.

Gastro-enterostomy operation is performed usually by triple-bladed forceps, of which there are many varieties in use, such as — (1) Moynihan's triple-bladed stomach clamp, (2) Roosevelt's triple-bladed stomach clamp, (3) Mayo-Robson's triple-bladed stomach clamp, and others.

Having none of these in the dispensary, I ordered for one from Bombay, as a case of huge dilated stomach of 18 years' standing due

bowels. The grip is made firmer or looser by placing the portion of bowel closer or further from the joint and also by simply tying a piece of thread at the ends of the blades.

5 The grip of bamboo blade is not so tight as to clamp the stomach tightly crushing its blood-vessels, etc., so much as to reduce its vitality.

6 The elasticity, flexibility, and softness of bamboo blades do not require rubber tubing

for the blades, nor seriation of the inner surfaces of the blades, nor curvature of the blades

NOTE

By LIEUT.-COL. F P CONNOR, DSO, FRCS

A SPECIMEN of a bamboo clamp, which can be quite easily improvised in a few minutes, has been sent to us by Dr Khurshed Husain, M.B., Ch.B. (Edin.), District Civil Surgeon, Raichur. This instrument was used, we are informed, for operating on a case of huge dilated stomach of 18 years' standing, due to pyloric stricture.

The idea is an ingenious one, and owing to the natural elasticity of bamboo, quite an efficient clamp can be made. The nature of the contrivance can be readily understood by studying the diagram (Fig 2). Two separate pieces of bamboo, A and B, are split at one end X and Y, and when tied together at the knotted ends, C, in the groove provided, a three-bladed clamp is improvised. When the selected portion of stomach and bowel are introduced by separating the split ends at X and Y, the blades are clamped together by tying them at the notched ends, D, and anastomosis can be readily effected.

We have not had an opportunity of trying this instrument on an actual case, but feel sure that it would serve its purpose admirably.

EPITHELIOMA OF UPPER LIP IN A BOY 14 YEARS OF AGE

By L. P. STEPHEN, M.B., F.R.C.S.,
LIEUT.-COLONEL, I.M.S.
Civil Surgeon, Karachi

THE history was that two years ago a tumour appeared on the right upper lip. It was removed by operation and a recurrence took place three months after.

The physical signs on admission to Karachi Civil Hospital, in February 1920, were as follows—

A tumour was present on the right upper lip, which extended beyond the middle line to the left and involved also the right angle of the mouth and a part of the lower lip. The tumour was hard with raised edges, ulcerating and fungating, covered with dirty wash leather slough and discharging sero-pus.

On the right cheek adjacent to the principal tumour were several secondary nodules, which were raised and warty in appearance, but were not ulcerating. The submaxillary and submental glands on both sides were enlarged and hard, but were not adherent to the jaw.

At the same time there was a tubercular spondylitis of the left fourth toe. The toe was amputated and the diagnosis confirmed.

A piece of the tumour of the lip was excised and sent to Parel laboratory for examination and the report was "A rare case of epithelioma of the lip."

The case appears worthy of record, owing to the rarity of epithelioma of the lip in so young a patient. Photographs of the case are attached

NOTES ON A CASE OF CYSTIC KIDNEY

By A. VISWALINGAM

Acting Medical Officer, Kuala Langsar, Perak

A TAMIL male, aged 30 years, was admitted to the District Hospital, Kuala Langsar, on 14th April, 1919, for a swelling on the left side of the abdomen, with pain in that region and also on the left flank, and slight cough at night. He also gave a history of passing liquid stools with mucus. These symptoms were said to have existed for about a fortnight only. Later, however, the patient gave a history of having suffered from intermittent pain on the left side of the "stomach" since he was 10 years of age, but this did not disable him from work or cause any other inconvenience until a fortnight before his entry into hospital, when the pain was severe, and a lump was noticeable on the "stomach" region.

Abdomen inspection—A tumour was seen on the left side of the abdomen, filling its entire upper half. It extended to about two inches below the umbilicus, above, it was lost under the costal margin. Laterally it extended to the spine, filling the left flank.

Palpation—It was smooth and had rounded borders below, at the middle a notch could be made out.

Percussion—It was dull in its entire extent, the dullness extending to above the 6th intercostal space.

Deep fluctuation could be elicited. On exploration it was found to contain hæmo-serous fluid.

Operation—An exploratory laparotomy was performed. The incision was made through the left rectus. On opening the peritoneal cavity, a large cystic tumour (Fig 1) was found to lie behind it, and practically to fill the left side of the abdomen. The descending colon was found tightly stretched over the tumour, which was found to arise from the left kidney. The right kidney having been found to be healthy, the operation for the removal of the left organ was proceeded with.

The tumour was incised and 12 pints of clear fluid (measured) were evacuated. Owing to the friability of the tissues and the presence of several adhesions between the tumour wall and the surrounding organs, considerable difficulty was experienced in its removal. The kidney having been freed, the ureter and the vessels were separately clamped and ligatured at the hilus, and the kidney removed. The ureter was found dilated to such an extent that one's thumb easily slipped into it. Very little blood was lost, and there being no further oozing, no drainage was provided. The wound was closed in layers and a permanent dressing was applied. The patient was on the table for about one hour and 45 minutes and stood the operation well.

On 25th April, 1919, the stitches were removed, when the wound was found to be perfectly healed up (Fig 2).

EPITHELIOMA OF UPPER LIP IN A BOY 14 YEARS OF AGE

By LIEUT COL L P STEPHEN, MB, FRCS, I.M.S.,

Civil Surgeon, Karachi



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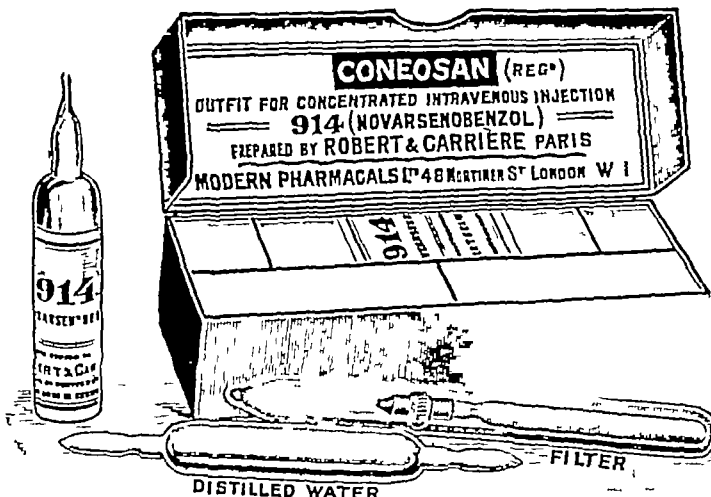
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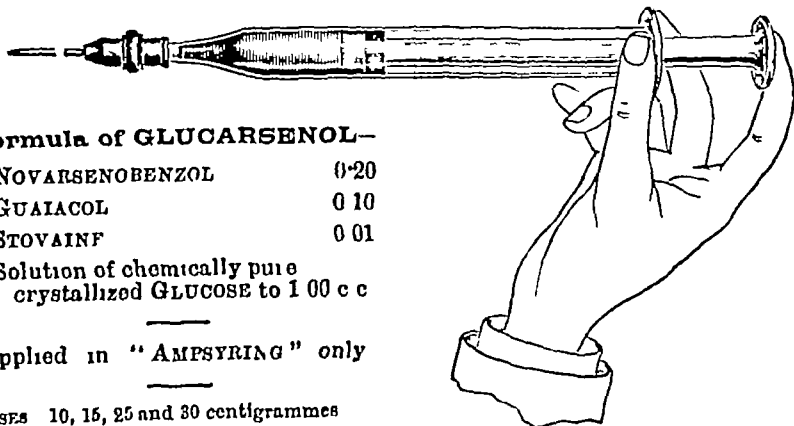
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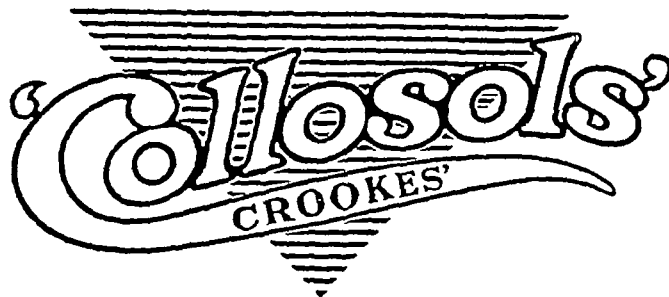
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Indian Medical Gazette.

JUNE

PROFESSIONAL MISCONDUCT

NATURE seeks to preserve the species at the expense of the individual,—medical practitioners ought to remember this, and not allow their actions to be influenced by competition. Competition may be the life of trade, but is most assuredly the death of any profession. Where competition is strong and medical ethics are weak, we shall find glaring instances of the desire to belittle a colleague with a view to acquire his patients. Such instances are, we regret to say, too common here in Calcutta. It was only the other day that a practitioner, who had been duly engaged to attend a lady, but was late, having been away from home when the summons came, on his arrival at the house found his way literally barred by another practitioner who had been called to attend to an emergency. The man claimed the case as his own! So far no united action has been taken against him which is a pity. A man who will thus act against a professional brother is not likely to have any scruples where his own interests, as against those of his patients, are concerned. What is required is a Medical Union, in order that such cases may be duly investigated, and the guilty punished by ostracism, for the Medical Council does not concern itself with cases of this kind. Unfortunately the Medical Councils' decisions err on the side of leniency—mercy would be a misnomer—in cases of grave professional misconduct. Recently a practitioner was proved to have given a certificate as to the cause of death without examining the body. The autopsy showed that death was due to rupture of the spleen, and not to the cause guessed at by the practitioner. On his conduct being brought to the notice of a Council, he was censured. Apparently some members of that Council did not realise the gravity of his offence, or were not jealous of the honour of the profession. Had he been in practice in Britain it is certain that he would have had his name removed from the Medical Register and the fact would have been published in every newspaper. Here it has been argued that to publish the decisions of Medical Councils amounts to defamation! We know only too well how the hirelings of the Bar can,

and do, twist the words of any section of any Act to suit their clients, but we cannot conceive that any judge could be such an ass as to hold that a man, who had by his peers been held to be guilty of infamous conduct in a professional respect, was defamed by the fact being made public. In the interests of the people it should be known who is trustworthy and who is not. *Salus populi suprema lex esto!*

Current Topics.

On the Effects of Injection of Quinine into the Tissues of Man and Animals

Jl of Hygiene 1919 Oct Vol 18 No 3
pp 317-336 With 1 plate—LEONARD S. DUDGFON

THE author who was Consulting Bacteriologist to the British Salonica Force, was requested to carry out an experimental enquiry on animals as to the effects produced by intra-muscular injections of strong solutions of quinine. Cast mules and horses, rabbits, guinea-pigs and frogs were used and the preparations of quinine were—(a) bi-hydrochloride in saline, (b) acid sulphate in saline (soon abandoned), (c) quinine alkaloid dissolved in alcohol, and (d) in ether. Those most commonly employed were (a) and bi-hydrochloride dissolved in brandy, the quinine solutions were injected in dilute as well as concentrated solution. Control observations were made on the action of acids and ether (quinine solvents) on the tissues of animals. Human muscle was examined from fatal cases of malaria or suspected malaria which had received an injection of quinine at periods varying from one hour to three months from the time of inoculation. The chemical estimations of residual quinine were undertaken by Captain Ferry, R.A.M.C., Analytical Chemist.

The conclusions reached were as follows—

(1) Concentrated preparations of quinine produce more intense necrosis than dilute, but dilute preparations such as are of practical utility excite oedema and necrosis at the seat of inoculation. The difference between these two methods of quinine inoculation is not of sufficient value to justify active opposition to the method commonly employed.

'Inoculation of quinine in solutions so dilute as to avoid oedema and tissue necrosis is not of practical utility in the human subject.

(2) A concentrated solution of quinine is absorbed rapidly from the tissues as shown by chemical analysis even in patients who are in *extremis*. It is not apparently stored as such in liver, kidneys or heart muscle.

(3) It is essential to realise that tissue necrosis—spreading oedema and local blood destruction are produced by the solvents employed for quinine administration, and the effects are only slightly inferior to those excited by quinine salts and the alkaloid.

(4) No advantage was obtained by the addition of olive oil or fat or by injecting the alkaloid dissolved in alcohol, or ether, whether in concentrated or in a dilute solution.

(5) Tissue necrosis occurs immediately and persists for a considerable period. In some instances the fibro-mycosis which results is associated with a fibro-neuritis which causes various symptoms definitely related to the pathological processes.

(6) Necrosis of blood vessels in the area of inoculation is a common result. This leads to small hæmorrhages into the tissues, and has caused severe

hæmorrhages in the human subject and experimentally, from rupture of a large vessel. The destruction of the vessel wall is associated with an accompanying thrombosis.

"(7) An extensive necrosis produced by an intramuscular injection of quinine, in the neighbourhood of an important nerve trunk, may result in nerve palsy. Experimentally, complete degeneration of the great sciatic and other nerves has been produced apart from any direct injury to the nerve at the time of the inoculation. In the human subject this disastrous result may be due to spreading œdema and extensive tissue necrosis.

"(8) Experimentally, no leucocytosis has ever occurred from quinine injections, on the other hand a leucopenia may develop, while an increase of large hyaline cells has been recorded on several occasions.

"(9) No essential differences in the degree of tissue necrosis from intra-muscular injections of quinine in malarial fever or malarial fever associated with blackwater fever were observed.

"(10) Repeated intra-muscular injections of quinine should not be given into the same tract of muscle, or tissue directly adjacent as otherwise permanent injury of muscle or nerves may occur."

The account of the examination of human muscle is of special interest. A few extracts are given.

"A man, comatose from malarial fever, was admitted to hospital, an intra-muscular injection of twenty grains of bi-hydrochloride of quinine was given, but the patient died one hour later. At the autopsy a large tract of black green necrosis about four by four inches surrounded by gelatinous œdema was discovered at the seat of inoculation. Twelve grains of bi-hydrochloride of quinine were injected into the right buttock forty-eight hours before death. At the autopsy a large area of complete necrosis of muscle was observed together with a wide tract of hæmorrhage due, as was proved on microscopical examination, to complete destruction of the wall of a large artery.

Two intra-muscular injections of fifteen and twenty grains respectively had been made at an interval of twenty-four hours and death occurred about twenty hours later. The resulting lesion was similar in each case—large area of necrosis, a band of hæmorrhage and congestion, with a wide tract of gelatinous œdema."

All the cases examined had received concentrated quinine. The author writes—"The fact that necrosis of the tissues always accompanies the intra-muscular or subcutaneous injection of quinine is not realised sufficiently by medical officers. This method should only be employed when circumstances demand it."

[This is an important paper which should be read by all actual or prospective tropical practitioners. These will probably be deterred from ever giving intra-muscular quinine injections, those, if they have given many hundreds without apparent harm, will continue to give them to selected cases, but assuredly with more circumspection than before. For subjects who are in bad condition or desperately ill the intravenous route would appear to be the better.]—*Tropical Diseases Bulletin*

The Value of Intramuscular Injection of Quinine in the Treatment of Macedonian Malaria, and some Conjectures concerning Quinine Therapy in general

Jl Roy Army Med Corps 1919 Sept Vol 33 No 3 pp 251-261—H W WILTSHIRE

THE author places on record his view of the value of intramuscular quinine in the treatment of malaria originating in Macedonia. He is firmly of the opinion that this method of administration is more efficacious than when the drug is given by the mouth. A 50 per cent solution of quinine bi-hydrochloride was used for the injection and, as a rule, 20 grains of the salt were administered twice daily for four days. On the

fifth day treatment was continued by the mouth, usually 30 grains of quinine sulphate or bi-hydrochloride in solution every day for not less than three weeks. The solution for injection was sterilized in an autoclave three days in succession before issue, and again every morning when in use. This did not appear to detract from its therapeutic value. Symptoms of cinchonism are, if anything, more marked after oral administration than after injection, pain at the moment of injection is slight, septic conditions are obviated by good technique and no deleterious action on the heart has been noticed.

It is held that intramuscular injections are of more value than oral administration from the standpoint of (a) *Prognosis of life*, possibly because the drug has a stronger action against parasites in the internal tissues (cerebral type, etc.) (b) *The effect produced during the acute stage* due to greater certainty and rapidity of action. Hæmatological evidence supports this view. (c) *The chance of effecting a true cure of the disease*, because intramuscular administration is more lethal to spleen and marrow parasites than quinine by the mouth, as evidenced by (1) the great improvement noted in chronic malaria with cachexia and splenic enlargement and (2) the prevention of relapses in cases treated intramuscularly. These showed far fewer relapses than those given oral quinine (55 per cent as against 437 per cent).

The author furthermore records certain "Conjectures concerning quinine therapy in general." It is considered that an unstable quinine proteid compound is the most efficacious in destroying malarial parasites, and experiments of the author and others are cited to show that (a) Intravenous injections of strong solutions give rise to a large amount of unstable quinine proteid compound which is rapidly distributed over the body and produces the most rapid and powerful anti-parasitic effect. (b) Intramuscular injection gives rise to a fairly large production of unstable proteid compound, dissemination of which is, however, comparatively slow. The anti-parasitic effect is correspondingly slow compared to intravenous injection, but it is certain and sure. (c) Oral administration results in a comparatively small production of unstable quinine proteid compound, so that though the dissemination over the body is rapid, the anti-parasitic effect is relatively small.

The author believes that cinchonism is caused by the quinine which circulates in simple solution and not by quinine circulating in combination with proteid, and this suggestion is supported by MacGilchrist's minimal lethal dose experiments. The writer summarizes his conjectures as follows—

"(a) The real anti-parasitic agent is to be found in an unstable combination of quinine with a proteid of the blood plasma.

"(b) The quinine which circulates in the blood in simple solution, and is excreted in the urine unchanged, may be regarded as a waste product, and is innocent of anti-parasitic effect.

"(c) Some of the toxic effects produced by quinine on the body are due to the unchanged quinine which circulates in the blood in a state of simple solution"—*Tropical Diseases Bulletin*

CHOLERA

(i) Recent Researches on the Etiology of Cholera.

Edin Med Jl 1919 July Vol 23 No 1 pp 4-22 With 5 charts and 2 plates—E D W GREIG

(ii) L'étiologie du cholera.

Bull Office Intern d'Hyg Publique 1919 Aug Vol 11 No 8 pp 879-887

A RESUME of a conference held at the University of Edinburgh in May 1919. Many references are given.

to articles which Colonel Greig contributed to the *Indian Journal of Medical Research* for 1913 and following years. Tables, charts, etc. are omitted from the French version. Greig's researches extended from 1912 to 1916 and dealt with—

(1) *The effect of the rapidity of transportation on the propagation of cholera*—In addition to transport of infection by roads, ships and railways, aeroplane traffic may possibly become a source of danger.

(2) *Importance of pilgrimages in India as means of spreading cholera*—The author draws special attention to the immense crowds visiting the temple of Jagannath in Puri and states that during his residence in Puri he examined, bacteriologically, a certain number of cholera convalescents just before they returned to their villages. The result showed that 30 per cent of these pilgrims were infected and excreted the vibrio in their stools. They were mainly travellers by railways returning to their villages in even the furthest parts of India to form centres of infection.

(3) *Carriers of the cholera vibrio*—At the time Greig began his investigations it was generally held that the "comma" bacillus was more or less confined to the alimentary canal but as his work progressed he found that this conception was incomplete. Examination of the various organs in fatal cases showed that the germ had invaded the tissues. The vibrio was present in the gall-bladder in 80 out of 271 cases, and in 12 signs of cholecystitis were visible to the naked eye. A section of the gall bladder demonstrated that the greater part of the endothelial layer was destroyed and vibrios were present in the exposed tissues. In the sub-epithelial liver a reaction of cell growth was observed. Higher magnification showed definitely the presence of cholera bacilli in the deeper layers of the wall of the gall-bladder. Discovery of the germs in the bile was a result of importance because it provided exact information concerning the pathology of carriers. The bile is even a more favourable site for the development of the bacillus than the digestive tube since extraneous germs are absent. In the intestines, on the contrary, certain organisms occur which are inimical to the development of the "comma"—*B. pyocyaneus*, *B. proteus*, *B. lactis aerogenes*, *B. faecalis*. With chronic "carriers" the vibrio finds a home in the bile where it may dwell for long periods, escaping from time to time into the intestines and outside the body to become the origin of fresh epidemics.

(4) *Production of a "carrier" by experiment*—Live bacilli from cultures were injected into the ear of a rabbit; they passed on into the bile from which they could be obtained in pure culture. If a section of the gall-bladder of such an animal is examined the epithelial layer is seen to be damaged and a number of round cells appear in the sub-epithelial layer. The blood-vessels in the walls are congested and under a higher power the germs become visible even in the vessels themselves. If the injections into the veins are repeated further marked changes occur—Signs of cholecystitis and the formation of calculi round a nucleus of bacilli. The author has found biliary calculi containing germs in rabbits which had received the last inoculation a year previously.

(5) *Presence of the vibrio in the lungs*—During the early days of convalescence pneumonia is a common complication, often a fatal one. Sections of the lungs show the alveoli filled with exudation and cells and minute points of consolidation are present. The "comma" can be seen in the cellular exudations proving that the germ can penetrate the pulmonary tissue.

(6) *The vibrio in the urine*—Fifty-five cases were examined and in 8 of these the bacillus was isolated from the urine. Two of these patients had completely recovered and were at work.

(7) *Bacteriological examination of the blood in cholera*—In a certain number of cases attempts were made to isolate the germ but always with negative

results. Dr Greig thinks "it probable that the vibrio passes by way of the lymphatic system rather than through the blood-vessels" [Cf. Sanarelli this *Bulletin* Vol 14 p 179]. As the result of these researches the author puts forward "a new conception of the pathology of cholera," viz.—That the infection is general and the point or origin is the intestines thus resembling typhoid and para-typhoid fevers. Moreover it seems to him evident that, accepting this new theory, we must revise our ideas on many points which concern the etiology of cholera.

(8) *Agglutinins in the blood*—In many cases the amount of the agglutinins was determined daily from the first day of the illness. In one series of mild cases with rapid recovery the titre of the agglutinins was very high. In fatal cases the antibody response is practically negligible.

(9) *Pseudocholera vibrios*—Since a serum of strong power has been found an important aid in the identification of the vibrio the presence in the excreta of vibrios with characters allied to the type germ complicates the diagnosis. Morphologically these organisms are very like the true "comma" but they are not agglutinated by a serum which will agglutinate the typical germ; they hemolyse the red corpuscles which the "comma" does not affect. These pseudo-"comma" may be—(a) True cholera germs which have lost certain attributes or (b) Foreign bacilli partly "humanised."

Greig has found in Calcutta during the annual return of infection in the spring "every year the same phenomenon is the epidemic increased. In the 'rice-water' stools only true cholera vibrios were found." But as it reached its turning point and during its diminution pseudo choleraic germs began to appear together with the type organisms. And gradually, as the epidemic decreased this race of vibrios became more numerous. Studied from a serological point of view the author was able to arrange these atypical vibrios in certain groups.

(10) *Vitality of cholera vibrios outside the human host*—Upon this point earlier experiments are not quite reliable because in most instances, old cultures were used, cultivated for long periods in artificial media. For such experiments it is essential to use "non-cultivated" races that is to say, strains not raised in artificial media. Greig employed "comma" bacilli isolated from the "rice-water" stools. They were preserved in a dark place, in flasks kept at the temperature of the room. The number of germs in the dejections was counted daily until the vibrio was no more seen [see this *Bulletin* Vol 6 p 37]. Temperature plays an important role in the duration of the extra-corporal life of the "comma." In Calcutta during the cold season this life is longer than during the hot season. The critical months are the coldest months because the risk of infection increases owing to this extension of extra-corporal life.—*Tropical Diseases Bulletin*.

The Balance of Colloid and Crystalloid in Cholera, Shock, and Allied Conditions

Brit Med J 1919 Oct 18 pp 490-492—
BENJAMIN MOORE

As concerning colloids and crystalloids in metabolism normal or abnormal Benjamin Moore writes with authority born of much investigation. Restricted space makes it necessary to abridge this article, but the essential paragraphs will be given in the author's own words. The "texts" are—(1) "a review of a recent work by Richet, Brodin and Saint-Grons (*C R Acad Sci* 1919, p 9) on anaphylactic shock in which it is shown that such shock can be prevented by the addition of sodium chloride to the dechaining dose of serum or by rendering the blood hypertonic with saline before the serum is injected.

(2) "a letter from Sir Leonard Rogers"—see above

"Now these two sets of observations [value of intravenous injections of hypertonic saline in cholera, failure of added gum arabic which proved of great value in cases of surgical shock] are by no means contradictory, but most beautifully complementary, also both are in consonance with the findings of the French school on anaphylaxis, and, as will be shown, with the earlier observations from India of Sutherland and McCay (*Biochem J* 1909, p 1) that hypertonic salines inhibit hæmolysis either in a natural hæmolytic system or an actively created one with a specific hæmolysin, as in the Bordet-Gengou reaction and the Wassermann test"

"The common cause of all these phenomena is a disturbance of that delicate equilibrium between the colloids of the blood and cells (such as proteins and lipoids) and the crystalloids (such as sodium-chloride) existing united or absorbed in common solution or suspension"

"Taking first, the positive effect of a colloid such as blood-proteins, gelatine, or gum acacia, in shock due to hæmorrhage, surgical injury or prolonged anæsthesia, as compared with the failure of simple hypertonic salines under these conditions, we find that the situation is one of a circulating fluid not merely defective in total volume but also relatively poor in colloid compared to crystalloid. Accordingly inorganic salts, or salines, given alone are here rapidly eliminated, having no colloid to anchor them, and so being treated as foreign bodies and thrown out by kidneys and intestine. But gum arabic, gelatine and plasma proteins cannot be so expelled, and serve to anchor inorganic salts and so preserve the equilibrium of crystalloid and colloid not only in blood but in the master cells of brain and heart, where the state of aggregation of the protoplasm would soon become altered"

The author then refers to experiments showing interaction by changes of osmotic pressure when the concentrations of salines, in which the colloid is in solution, are varied—*Am J of Physiol*, 1902 and *Biochemical J*, 1906. The investigations referred to show—

(1) "That a solution of gum arabic made in water or saline, as recommended by Bayliss, and injected intravenously will at once seize upon or hold a certain amount of saline in the blood, and as a result of its presence the total salt content of the blood with which nerve and muscle cells stand in common equilibrium will rise, and (2) the most important fact that as a result of this absorption the state of aggregation of the injected gum will change so that the "molecular weight" or "solution aggregate" is only about one-third to one-fourth of its former value—for this is precisely what the fall in value of the osmotic pressure means on Avogadro's law"

"Take next the case of efficiency of hypertonic salines in cholera, and inefficiency of colloidal solutions such as gums, and it is clear that this is as it ought to be, for the condition is one of excess of toxic colloids and defect of balancing electrolytes or salines"

"On the other hand free saline in the blood in such diseases as cholera combines with toxins to form a crystallo-colloidal union, and this is an essential factor in excretion of the poison by intestine and kidney. The unattached colloidal molecule of toxin possesses no osmotic pressure, nothing to drive it through an excreting cell. When it becomes attached to a crystalloid the combination acquires a directive force like a gas molecule within a porous pot, and like this now possesses a power of diffusion"

The foregoing principles are next applied to the phenomena occurring in shock, the Bordet-Gengou reaction, the Wassermann test and in anaphylaxis, subjects not strictly relevant to this "Section". Then follow paragraphs of general interest, for an account of which space cannot here be found.—*Tropical Diseases Bulletin*

Antimony Tartrate for Bilharziasis: A Specific Cure

Lancet 1919 June 14 pp 1021-1023—J
B CHRISTOPHERSON

ANTIMONY TARTRATE has been used as a routine treatment at the Khartoum Civil Hospital since May 1917, and the author now feels justified in maintaining that it is a specific cure, not only killing the adult Bilharzia worms but later also the embryos in the ova in the tissues, and thus eliminates the infected person as a carrier as well as curing him of the disease. In the present paper 30 additional cases are recorded in which the treatment has been satisfactory. The need of caution in the use of the drug is emphasised here as in the author's previous papers. The total amount of antimony tartrate necessary to effect a cure would appear to be less than 25 grs in all. Suspected relapses are due to the gradual elimination of dead ova. Eggs will not hatch after about 12 grs have been given although a marked improvement in the urine is noticeable even on the 5th day when only 3½ grs in all have been injected. Antimony is cumulative in the tissues. [Details of treatment are given in previous papers see *Bulletin*, Vol 13, p 206]—*Tropical Diseases Bulletin*

A Case of *Trypanosoma rhodesiense* Infection which recovered

Lancet 1919 Nov 7 pp 829-830—C W
DANIELS and H B NEWMAN

THE patient was a young man of twenty years. He went to Nyasaland in September 1913, between that date and December 1914, he was frequently bitten by tsetse in various parts of North Eastern Rhodesia. In December 1914, he moved to the frontier of German East Africa where he remained until April, 1915. During this period he was constantly in fly-infested areas. In September 1915, shortly after returning to Fort Jameson, he began to get attacks of what he thought was malaria. Malaria parasites were found, but as quinine did not stop his fever a gland in his neck was punctured and trypanosomes were found.

Whilst in hospital in Rhodesia he had atoxyl, gr 3½, every third day, this continued until he landed in England in November 1915, and came under the care of Dr Daniels. Treatment at first consisted of atoxyl gr 3½ thrice weekly intramuscularly, with antiluetic gr ½ in solution once daily by the mouth. On December 8, 1915, injections of antimony oxide (Martindale) subcutaneously were begun, starting at first with a dose of 30 minims per diem and increasing this gradually until as much as 130 minims were given in 24 hours. The atoxyl and antiluetic were continued although owing to severe nausea it was found necessary to stop the latter drug from time to time. In March 1916, the characteristic circinate rash was first noticed, it lasted about a week, then gradually subsided. As trypanosomes still appeared in the blood from time to time it was decided to stop administration of antimony oxide and to try the effects of repeated intravenous injections of tartar emetic in doses of grs 2½ twice a week. The administration of atoxyl was also discontinued, but the antiluetic was continued. Tartar emetic injections were continued until April 1918. Trypanosomes were seen for the last time on April 6, 1916. Since cessation of treatment the patient has remained in good health. The authors write—

"The case is chiefly remarkable from being the first on record in which one may feel fairly confident that a definite cure has resulted in a true case of Rhodesian trypanosomiasis, and for the really enormous amount of tartar emetic it was found possible to administer. In all the patient had considerably over 500 grs of the drug, and no untoward effects of such administration have manifested themselves"—*Tropical Diseases Bulletin*

Modern Conceptions of Heart Disease

The Practitioner March, 1920—W. EDGECOMBE,
M.D. M.R.C.P., F.R.C.S.

THE writer referring to the work of MacKenzie Lewis and others points out that the old conception of valvular disease and its after-effects was largely a mechanical one. While infection was recognised as the initial cause the after-effects were explained by interference with the normal course of blood through the heart leading to dilatation, hypertrophy, back pressure and general venous engorgement.

The modern conception places the valvular lesion after infection or poisoning of the heart muscle. If the conducting and contractile muscle fibres are intact and healthy the heart is able to maintain the circulation efficiently for all needs through a long and strenuous life, in spite of permanent damage to the valve and the consequent regurgitation.

In support of this may be mentioned the following facts—

(1) The experimental production, aseptically, of a valve lesion causing regurgitation is not necessarily followed by enlargement or by any change in the muscle.

(2) Cases of frank valvular disease may be found post mortem to show no change in the muscle.

(3) The largest hearts found post mortem are frequently those in which there is no valve lesion discoverable, as in syphilis, renal disease, emphysema, adherent pericardium, and alcoholism.

Apical systolic bruits—It follows that a systolic murmur at the apex may be discounted unless there is enlargement of the heart or a definite history of rheumatism. The loudness and character of the murmur, its conduction, give no help, for cardio-respiratory bruits may be equally well conducted through the axilla to the inter-scapular region.

Mitral disease—The writer prefers this term to mitral regurgitation or mitral stenosis which are merely different degrees of the same process. While the presence of a systolic bruit is no proof that mitral disease exists, a pre-systolic bruit is definite evidence that the valve is affected and usually connotes a more or less generalized carditis, with damage to the heart muscle, especially the conducting paths.

Aortic disease—Similar remarks may be made about aortic disease. In aortic disease the risk of damage to the heart muscle is accentuated by the proximity of the coronary arteries. Hence the greater seriousness of aortic disease.

The foregoing facts are recapitulated as follows—

"In the diagnosis of organic disease of the heart—

1 A systolic bruit alone is of no value

2 A systolic bruit with a permanent enlargement of the heart is definite evidence of

organic disease, but it is the enlargement that matters, not the bruit

3 A diastolic bruit is definite evidence of an organic valve lesion, without a permanent enlargement, it is of relatively less import, with enlargement, there is definite evidence of carditis

4 Enlargement, with or without a bruit, is definite evidence of organic disease"

Discussing the functional efficiency of the heart the writer proceeds—

"As the outcome of the foregoing considerations our outlook on valvular heart disease has undergone material change—from the prognostic point of view. No longer are we obsessed by the importance of murmurs when unaccompanied by other and more important physical signs. It has become recognised that the functional capacity of the heart to perform its appointed task is of more importance than the mere structural defects. If the exercise-reaction of the heart is good, the tolerance of sustained exercise equally good, and there is no enlargement of the heart, there is strong presumption that the muscle is undamaged, and systolic murmurs of whatever origin may safely be neglected as of little or no moment. If a diastolic bruit is present, either at the mitral or aortic area, there is certain evidence of structural organic disease, but here, again, if the exercise-reaction and tolerance are good, and there is no enlargement, a good prognosis may be given. More careful watching is required, however, of the future progress of such cases, for there is more likelihood of muscle damage having taken place, or of slow chronic infection going on."

Rhythm of the heart—The chief forms of irregularity in rhythm and their separate significance are—

(1) *Sinus irregularity of the young*, in which the stimulus begins at the sino-auricular node and is probably a vagus effect. It is seen typically in respiratory arrhythmia.

(2) *Sino-auricular block*—A relatively uncommon form in which the stimulus arises at the sino-auricular node, but every now and then fails to materialise giving rise to a pause when the whole heart is at rest.

(3) *Extra-systoles*—The type of irregularity is extremely common and usually of little moment. The polygraph will in most cases show whether they are of auricular or ventricular origin, and an electro-cardiogram will determine their exact origin. They usually tend to disappear if the heart is accelerated by exercise or emotion to the inter-scapular region.

If extra-systoles only appear after exertion, they are of much serious import as they indicate some mechanical interference with contraction.

Extra systole may be present throughout life without impairing the efficiency of the heart.

(4) *Paroxysmal tachycardia*—This stimulus to contraction in this case arises in some ectopic

focus in the wall of the auricle. It is characterised by sudden onset, absence of variability in rate to changes of posture or to exercise, and equally sudden cessation after lasting a variable period of hours or days. The pulse is regular throughout.

Auricular flutter—The auricle in response to stimuli from an ectopic focus beats at a rate up to 300 beats per minute. The line between paroxysmal tachycardia and auricular flutter is fixed at 200 per minute. The ventricle is unable to respond to a rate of over 240–250 per minute. It is impossible to measure the rate of auricular contraction except by means of the electrocardiograph.

Auricular fibrillation—The common irregularity of the failing heart. The pulse is wholly irregular, no two beats being alike. The auricle instead of contracting as a chamber exhibits a tremulous flickering of bundles of fibres. Only some of the ectopic stimuli responsible for these contractions get through to the ventricle, hence the irregularity.

The diagnosis can be made clinically, a polygraph tracing will show the absence of the auricular wave, or a series of small waves due to the fibrillation.

The electrocardiogram will show the absence of the P wave due to the auricular contraction and its replacement by a number of small waves. Fibrillation once firmly established usually endures for the rest of life.

Ventricular fibrillation—This is a new conception of the terminal stage of heart failure. Sudden death may sometimes be due to ventricular fibrillation caused, for example, by sudden obliteration of a coronary artery.

Heart block—This is a well-known condition, due to disease of the conducting tissue of the heart, the condition may be inferred from a persistently abnormally slow pulse rate and the diagnosis made certain by means of the electrocardiograph or polygraph.

Pulses alternans—This condition is best recognised by taking a pulse tracing with an ordinary sphygmograph. It usually indicates a failing myocardium.

"Toe Rot"—A Rapid Method of Cure

Journal of the Royal Naval Medical Service
Vol V No 4 October, 1919—A O Ross,
M B, R N

A CONSIDERABLE NUMBER of officers and men who have served abroad, particularly on the China Station, return home with a distressing and chronic complaint, which is termed "toe rot" or gouty eczema. The condition always manifests itself in hot weather and may carry on in winter also. It consists in a necrosis and sloughing of the epidermis between the toes. The skin is most unhealthy, presenting a bleached pale lemon-yellow appearance and has a most disagreeable odour. In some cases fissures appear and these give rise to pain, but as a rule

the patient's chief complaint is the most abominable smell which meets him on removing his boots.

In destroyers one has a very limited choice of remedies, and as three of the four officers on board were applying for relief some potent remedy had to be devised. The Service "antiseptic paste" has an odour, but it is greatly to be preferred to the odour of necrosed skin, so a tube was served out to each of the victims with directions to apply it on alternate nights. The results were astonishingly good. The odour went, the skin ceased to peel off, the fissures healed. All this in ten days! Since then I have used this remedy many times with equally successful results, and I suggest it to all medical officers who are besieged by the victims of "toe rot."

Cardinal Cardiological Principles

WRITING under this heading in the *British Medical Journal*, November 15, 1919, Lewis gives the cardinal points to which attention should be directed in the daily examination of chronic affections of the heart as follows—

1 *The symptoms and signs of cardiac failure*—These are sub-divided into two categories—

(a) *The early evidences of an impaired circulation*—These are constituted by the symptoms which produce distress on exercise. The three chief are fatigue leading up to exhaustion, breathlessness, and pain. In all patients, whether the subjects of actual or supposed cardiac disease, to know the tolerance of physical work is more than half the battle in arriving at a correct estimate of the case. A knowledge of the body's reaction to exercise in health, in ill-health and in the chief forms of heart disease is paramount. The writer does not mean the rise and fall of pulse rate or of blood pressure, they are of service, but those who measure the reaction in this way fail to appreciate the essential—the amount of work which produces distress. A man may have an exhaustive knowledge of electrocardiography, polygraphy, blood pressure, percussion, the stethoscope, and what not, as a practitioner he is better without that knowledge if the first knowledge is lacking. It is of more consequence than the remaining cardinal points, for no patient who has a normal exercise tolerance has grave heart disease, and the gravity of the disease in a series of real heart cases is proportioned to the degree of distress produced by a given amount of work more nearly than it is to any other observable phenomenon.

(b) *The signs of cardiac failure of the congestive type*—These are cyanosis and engorgement as observed in the veins of the neck and in the liver. When present the exercise tolerance is never normal or near normal. The disease is then advanced.

2 *The signs of cardiac enlargement and its degree without attempt to differentiate dilatation and hypertrophy*—Palpation ranks before inspection and percussion. The chief sign is the position and extent of the maximal thrust and the structures it involves.

3 *Signs of valvular disease*—Cardinally these comprise (a) signs of aortic regurgitation which are obtained reliably as often at the pulse as at the base of the heart, and (b) signs of mitral stenosis, of which but two are valuable—namely a diastolic thrill in the apical region and a diastolic rumble of low pitch audible over the maximal thrust, and best heard, often only heard in the recumbent posture after the action of the heart has been accelerated by exercise.

4 *The presence or absence of fibrillation of the auricles*—If the heart is beating irregularly it should be ascertained whether fibrillation of the auricle is present or not. To obtain the last knowledge a few simple tests nearly always suffice.

(a) If there is constant quickening of the pulse during deep inspiration fibrillation is not present.

(b) If the heart beats at a rate of 120 or over, or can be induced by any means to beat at such rates while the pulse remains irregular, fibrillation is almost certainly present. The faster the rate the more certain the diagnosis.

These tests are not exhaustive but they are sufficiently so for general practical purposes. The remaining disorders of cardiac rhythm, either on account of their comparative rarity or because their significance in treatment is far smaller, are not cardinal.

5 *Infection*—No examination is complete until the presence or absence of infection has been fully considered. The chief signs are—

(a) *Pallor*, especially when accompanied by sallowness or duskiness of the facies. This sign is of particular value in aortic disease. Pallor is then of ill omen.

(b) *Palpable enlargement of the spleen*, which is not a reliable sign of engorgement of the viscera, but is usually a sign of active infection of the valves in cardiac cases.

(c) *Petechiae* in the conjunctivæ, mouth, or in skin round the base of the neck and shoulders. They are far more frequent than has been suspected until recently, and should be searched for repeatedly in all sallow cardiac patients.

(d) *Clubbing of the fingers*, which, when slight, is more frequently accompanied by infective endocarditis than by venous engorgement.

(e) *Fever*, constant or only at times.

(f) *A pulse rate constantly over 90 or 100 during rest while the pulse is regular*.

(g) *Gradual but steady loss of weight*.

(a) to (c) are more especially signs of infective endocarditis, a condition which in its sub-acute and chronic forms is much more widespread than is commonly believed, and terminates the lives of a goodly percentage of cases

of aortic regurgitation or mitral stenosis. Signs (f) and (g) are also yielded by intoxications.

6 *When evidence of disease is found, its etiology is to be taken into consideration*—It may be of rheumatic, syphilitic, or other infective origin, or it may result from senile changes. The etiology will control prognosis and treatment.

Instrumental examinations, he writes, are subsidiary methods, useful in checking or revising bedside tests, but essential only in a few patients.

Dr Lewis lays great stress on exercise tolerance as a guide both to diagnosis and prognosis. If a patient takes exercise without undue discomfort, has no cardiac enlargement, no aortic disease and no mitral stenosis, he can be told that his heart is sound. On the other hand where there is definite enlargement, aortic disease, or mitral stenosis, or fibrillation of the auricles, the safe course is to attribute any undue distress on exercise to a cardiac lesion. In young subjects, if there is no immediate evidence of heart disease a deficient exercise tolerance should rarely, if ever, be ascribed primarily to the heart. In elderly subjects more diffidence should be shown in the absence of signs of structural diseases as pain, breathlessness or undue fatigue, and often the only signs of grave angina pectoris or myocardial degeneration.

As regards treatment the cardinal principle is to regulate the physical strains thrown on the organ. Work is good as long as it does not provoke undue breathlessness, fatigue or pain. Those acts which cause distress should be prohibited.

The indications for bed treatment are (1) distress caused by rising to the feet or by walking leisurely, (2) active infection, (3) the necessity of drastic treatment by a drug such as digitalis.

The chief value of digitalis lies in its power to control the ventricular rate in fibrillation of the auricles. To the heart digitalis is not a cardiac stimulant but a powerful hypnotic. It prolongs the diastolic periods, during which the heart sleeps.

Ionization

The Practitioner—By MARK WARDLE, L.R.C.P. & S., V.D., Hon Surgeon, Bishop Auckland Cottage Hospital, etc.

HAVING worked at this method of treatment throughout the last year, I have found two outstanding results—(a) its wide range of usefulness, (b) its certainty.

In treating cases with ions some important points must be kept in mind viz—

Correct polarity,

Accurate contact of the electrodes,

Protection of any tender surface by coating with a non-conductor (collodion, for instance)

In treating an area one need not worry about having contact with *every* portion of it, seeing that ions travel quite a considerable distance beyond the point of contact, for instance, the whole of the surfaces of such a large joint as the knee can be freely "douched" with ions driven from a pad placed over the knee—but much care must be exercised in the protection of delicate parts of the skin, or there will result burns that will take something like two months to heal.

I append notes of some cases, chosen as being the worst of their particular kind, and on account of their diversity of character.

1 *Chronic gouty arthritis of knee*—The slightest movement caused severe pain. X-ray photo showed osteophytes at several points, and considerable denudation of patellar cartilage. *Treatment*—Two per cent solution of potass iodid in pad placed over knee. 50 M A, 30 min alternate days. After first application pain almost gone. After second, patient walked for an hour in comfort. Regular application for four weeks, occasional afterwards. X-ray photo three months after, no osteophytes visible, use of limb normal.

2 *Chronic ulcerative keratitis*—Entire eye-ball inflamed, sight almost nil. Several months' treatment by numerous methods resulted in no improvement, and excision to save the good eye seemed the only thing left. Zinc ions by pad over closed eye. 5 M A, 10 min alternate days. After first application improvement commenced. After seventh, ulcers all healed, no opacity, the rest of eye-ball free from inflammation and sight normal.

3 *Polypoid growth* with extensive granulations involving anterior portion of tympanic membrane and adjacent parts, free discharge of fetid pus, could hear only sharp loud sounds. Zinc ions, 8 M A, 10 min alternate days. Symptoms steadily improved, treatment continued for 20 applications (seven weeks). All growths gone, no discharge. Three months later no return of symptoms, can hear watch.

4 *Chronic rhinitis*—Much fetor and discharge. Zinc ions, 10 M A, 10 min alternate days. Continued for 20 applications. Two months later condition normal.

5 *Spinal curvature dorso-lumbar*—Of many years' standing (tuberculous?). Patient could only move about the room by holding to furniture, and suffered much pain. Iodine ions (sol potass iodid), 50 M A, 30 min alternate days—Pain relieved after first application, gradually disappeared. After twentieth, walks without help and gets up and down stairs.

6 *Carbuncle*—Had reached stage of frequent attacks of severe pain, slough firmly adherent. Zinc ions, 15 M A, 30 min. One application, pain ceased during application. Twelve hours later slough came away adhering to dressing.

7 *Ophthalmia neonatorum*—Baby fourteen days old. Lids of both eyes bulging and inflamed, pus welling out. Zinc ions, 3 M A, 3 min. After first application, eyelids normal, slight amount of pus. After second application, left eye normal, slight indication of pus in right, child can open its eyes freely. No sign of corneal injury.

8 *Sinus after mammary abscess (tubercle)*—Foul discharge. No improvement under various treatment. Running irregular, temperature up to 102. General and pulmonary condition getting steadily worse. Sinus slit up. Zinc ions, 20 M A, 30 min. After first application discharge slight. No fetor. Subsequent improvement steady, temperature normal. Second application given a fortnight later. General and pulmonary condition, a month later much improved.

9 *Inoperable cancer of rectum*—I have already reported this case in the *B M J* (Oct. 18). There is now (November 20) only a slight band of malignant growth at the anus, and I am confidently awaiting the termination of the case to prove that we have in zinc ions an efficient agent for the "cure of cancer."

Ionic Medication in Cancer.

The Medical Review Vol XXIII No 1
January, 1920.

"M. WARDLE (*British Medical Journal*, Oct 18, p 495) has treated a considerable number of cases of varied character by ionic medication. Impressed by the results, especially by the rapid destruction of carbuncles, he used it in an inoperable case of cancer of the rectum.

A man, aged 74, was admitted to the Auckland Poor Law Infirmary with cancer of the rectum. His age, his bad general condition, and the area affected, negatived any attempt at surgical treatment. The rectum, as high as the finger could reach, was filled by a hard mass, the perineum and the soft parts around the anus, extending laterally to the ischia and behind to the coccyx, were involved and indurated. There were a number of raised points commencing to suppurate, and he suffered from the usual typical attacks of severe pain. Having found that the excruciating pain of carbuncles is removed by one application of zinc ions, and influenced by the favourable effect of copper ions on lupus, the writer tried treatment by copper ions in the hope of at least relieving the pain without opium. The first application was made on July 8, and from that day until the twenty-fourth dose he was much relieved of pain, but in other respects remained in *statu quo*.

Zinc ions were then tried, and after one application pain ceased. On October 6, after 17 applications, his condition was as follows—The anus presented a ring of hard growth, the rectum, as far as could be reached, was soft and normal. All the induration of the perineum and surrounding area had disappeared and only one suppurating point—the largest—remained, but was much reduced in size. The old man was able to get up and walk about, and felt "quite well." His general condition was much improved.

The method adopted was as follows—The rectum was packed with a tampon of wool soaked in a 2 per cent solution of zinc sulphate, the depressions around the anus were packed so as to make the whole surface level, and a pad of 16 layers of lint applied, covering all the diseased structures with sufficient pressure to ensure accurate and equal contact throughout. The active electrode (positive) was attached to the pad, and the indifferent (negative) to the lumbar region. The current employed was 60 milliamperes for 30 minutes on alternate days.

This case proves that zinc ions relieve pain, and not only check malignant growth, but destroy it."

Inequality of the Pupils in early Syphilis.

The Medical Press and Circular January 21, 1920.

"INEQUALITY of the pupils without the Argyll-Robertson sign may be observed in all

stages of syphilis. The periods of its occurrence are variable in the course of the infection. The earliest time is during the fourth week from the onset of the primary sore, then later during the secondary stage, and later still in the tertiary. Admison (*British Journal of Dermatology and Syphilis* Vol XXXI Nos 10-12) quotes S Nicolau to the effect that this inequality of the pupils is often permanent, but that the persistence of the sign should not be regarded as definitely constituting a menace to the patient's future. Nevertheless, inasmuch as the lesion probably indicates some involvement of the nervous system it is one that should be carefully watched while it is advisable not to lose sight of patients who have early inequality of the pupils. Diagnostically it is also a valuable sign in cases of latent or doubtful syphilis. Early inequality of the pupils may co-exist with early lymphocytosis of the cerebro-spinal fluid, not only in the secondary period, but in the primary stage."

The Effects of Multiple Embolism of Pulmonary Arterioles

Quarterly Journal of Medicine Vol XIII No 50 January, 1920—J S DUNN

THE intention of the research outlined in this paper was to determine the effects on the circulation and respiration of mechanical blockage of the pulmonary arterioles. It is known that pulmonary irritant gases at a very early stage cause thrombosis of the capillary blood-vessels in the lungs, but it is uncertain to what extent the restriction of the pulmonary circulation thus brought about is responsible for the symptoms.

The animals used were chiefly goats and the substance employed to produce embolism was an emulsion of freshly prepared potato starch. This had the great advantage of not passing into the systemic circulation.

The starch emulsion was introduced into the jugular vein or into the right ventricle.

The results of the experiments are best described in the author's own words.

The methods adopted in this research are believed to provide, at first, an uncomplicated condition of multiple embolism of pulmonary arterioles. There is no reason to believe that any of the results which have been observed are due to lodgement of emboli in other organs than the lungs. In this respect these results may differ from those produced by experimental oil-embolism in animals, or from the phenomena of fat-embolism in the human subject. In the later conditions a considerable amount of the embolic material passes through the pulmonary capillaries, and, entering the systemic circulation, may cause lesions in the brain and elsewhere.

Where a large dose of starch emboli causes sudden death it apparently acts in a very direct fashion. The arterial blood-pressure falls almost at once to a fatal level, and the pressure in

the large veins rises simultaneously almost to the same figure, so that the circulation is brought to a standstill. It appears as if the passage of blood from the right to the left side of the heart were almost completely cut off in the lungs. There is also no doubt, from histological examination of the lungs in these animals, that the degree of obstruction of the pulmonary arterioles is very great.

Where the dose of starch is sufficient to cause sudden death, the blood-pressure in the right heart and great veins shows at most a transient rise immediately after the injection. Afterwards the venous pressure has been observed to remain at normal level for more than three hours in unanæsthetized goats, although during that time the animals showed symptoms of acute illness. The arterial blood-pressure, which has been recorded only in animals which were under the influence of a general anæsthetic, has remained at or above the normal level for an hour after similar doses. This maintenance of pressure during the first hour is of more significance than the subsequent fall, for there is no doubt that the anæsthetized animals die sooner after embolism than the unanæsthetized. From other experiments it would appear that there is no great permanent diminution in the amount of blood which passes through the lungs per minute with this order of dosage.

The maintenance of the arterial pressure and of the blood-flow in these experiments is all the more remarkable when it is considered that the vessels which are blocked are mainly arterioles and not capillaries. Whereas for any single occluded capillary the alternate routes are practically infinite an arteriole is an end artery on a small scale, and represents a definite division of the main pulmonary artery, so that its whole function cannot be adequately taken over by any other vessel. In these facts we have definite evidence of a *very considerable reserve of vascular area in the lungs*. We know that a large number of pulmonary arterioles can be occluded and yet leave the circulation substantially maintained, at any rate for the resting animal. Therefore, more blood must pass through the unobstructed arterioles than they are normally called upon to accommodate. Theoretically this result might be attained in any one of three ways (1) by diminution in the viscosity of the blood, (2) by increase of pressure in the pulmonary artery, and (3) by dilatation of the unobstructed vessels. It has been shown by estimation of the hæmoglobin that there is no diminution of the concentration of the blood and therefore of viscosity, and direct measurement has shown no lasting rise of systolic pressure in the right ventricle, so we are driven to the third conclusion that the pulmonary arterioles are dilated to provide compensation. In other words, we have indirect evidence that *the amount of blood which passes through the pulmonary arterioles is subject to regulation apart from that*

which is obtained by alterations in the pressure of the blood in the pulmonary artery

From the above considerations it would appear that the blockage of capillaries by thrombi in gas poisoning does not by itself constitute a serious obstruction to the circulation. In that condition, however, it is associated with other factors, such as pressure of alveolar fluid on the capillary walls, increase in the viscosity of the blood, and possible alterations in the texture of the endothelium in non-obstructed capillaries, and in the production of the total deleterious effect it may have a substantial share.

The peculiar form of dyspnoea caused by embolism is of special interest in that it appears to be determined by nervous influence. It follows almost immediately on introduction of the obstructive material, and the degree of its development may be quite disproportionate to the dose of emboli injected. The form of the dyspnoea is similar to that which rapidly followed inhalation of pulmonary irritants, and the two are in so far analogous that they are fully established before there is any production of œdema or other visible organic change in the lungs, and certainly long before there is any mechanical interference with the ventilation of the alveoli.

When death results from the less severe doses of emboli it is found that the primary obstruction of vessels has become complicated by secondary pathological changes in the lungs. These may also be observed in process of development in animals killed at intermediate periods. They comprise pulmonary œdema mainly interstitial, but in part alveolar, and spastic contraction of the atria and infundibula. The addition of these to the vascular blockage probably determines the late desaturation of oxygen in the arterial blood and ultimately the death of the animal.

The pulmonary spasm produced by embolism resembles in general that which is occasionally observed in gas poisoning, but differs in its time of incidence. In gas poisoning it is an early phenomenon, and it may, though rarely, be so complete and effective as to cause death within fifteen minutes of exposure to gas. The spasm of embolism has not been observed less than an hour after the start of the experiment, and even then it sets in gradually and only attains a maximum when death is imminent. The significance of this change is uncertain.

The Pathology of "Influenzal Pneumonia"

Boston Medical and Surgical Journal—F. P. McNAMARA, M.D.

THIS paper is based on the results of 95 post-mortem examinations performed at the Brady Laboratory of Pathology at the New Haven Hospital, Connecticut.

The writer, briefly referring to the etiology of influenza, states that while we do not know

the cause of influenza, there is a general consensus of opinion that it is not primarily due to the influenza bacillus. The most promising work is that of English and French investigators who have found a filterable virus in the blood of influenza patients, which when injected into monkeys produces a hæmorrhagic condition of the lungs.

The features noted on external examination of the body were plum colouration of the face, neck and upper extremities, frothy, blood-tinged fluid bubbling from the nose and mouth, jaundice due to increased destruction of red blood cells and cloudy swelling of the liver, and lastly intense rigor mortis.

On opening the thoracic cavity a slight excess of blood-tinged serous fluid was usually seen. There was sometimes fibrin but rarely purulent fluid.

The trachea and larynx were of a deep red colour and frequently showed punctate hæmorrhages. Superficial ulceration was common. An exudate of clear or faintly blood-tinged mucus with some fibrin was often seen.

The lesions in the bronchi and bronchioles are more intense and vary with the duration of the disease. In the early cases the lumen contains serum and mucus, the submucosa is congested and œdematous, while the epithelial cells are more granular than usual. More advanced cases show hyaline necrosis of the epithelium which may be absent in places, baring blood-vessels and leading to hæmorrhage. Bacteria, red-blood cells, and cellular debris are abundant. The necrotizing process may extend through the wall of the tube and lead to peribronchial pneumonia or actual abscess formation. When repair takes place contraction of the fibrous tissue may lead to obliterating bronchiolitis and bronchiectatic cavities. Owing to the number of actively dividing young epithelial cells the histological picture is like that of carcinoma.

The writer divides the lungs into three groups. The first, an acute fulminating type characterized by intense congestion, a tendency to hæmorrhage into the lung, an aplastic serous or sero-fibrinous exudate in which bacteria abound and hyaline necrosis, slight or great in extent, of the terminal bronchioles, and of the alveolar walls. Interstitial emphysema results from rupture of the latter structures.

In the second type the process tends to become localised, necrosis is marked. The lung retains its increased volume, but the consolidation is more liable to involve the lower portions of the lungs. In general the distribution is lobular. On section the most outstanding feature is thick pus welling from all the bronchial tubes.

The latter are dilated. The consolidation is patchy. Small and large abscesses may be seen, actual gangrene is sometimes encountered.

The third type includes those cases which survive a considerably longer time. Organization of the bronchiolar and alveolar exudate is

the prominent feature. Unlike lobar pneumonia this led to obliterating bronchiolitis and the formation of bronchiectatic cavities, as well as large areas where the alveoli were filled with granulation tissue.

The extra pulmonary lesions most commonly found were dilatation of the right heart, acute splenic tumour, cloudy swelling of the viscera, haemorrhages in the adrenal bodies, in the rectus muscles.

The organisms found were pneumococci, streptococci, the "influenza" bacillus, staphylococcus aureus, bacillus pneumoniae and micrococcus catarrhalis.

The pathology may be briefly summed up as follows —

"We have a disease of unknown origin but one which undoubtedly affects the upper respiratory tract and which may be primary in the lung itself. Acute laryngitis and tracheo-bronchitis result. Because of the injured trachea the mouth organisms gain access to the lung, perhaps already injured, and there set up a diffuse pneumonia. The latter is characterized at first by oedema, congestion, haemorrhage and hyaline necrosis of the bronchiolar and alveolar walls. Later the process tends to localize the necrosis of the lung, varying in degree from milium abscesses to actual gangrene results. If the patient survives, organization of the interstitial, bronchiolar and alveolar exudates results in fibrosis of the lung, obliterating bronchiolitis and in the formation of bronchiectatic cavities. The bronchiolar epithelium proliferates in this disease as in no other and has the histological characteristic of an epithelial neoplasm."

The Technique of Citrated Blood Transfusion

The Boston Medical and Surgical Journal Feb 1920 — MAJOR H. C. MARBLE, M.D., M.C. (U.S.A.)

THE writer states that "the transfusion of citrated blood now seems to have taken a very definite place in the surgical world. Its advantages over other methods are numerous, its therapeutic results are identical and when carried out with careful, painstaking technique it is safe, accurate and sure. Thousands of these transfusions were carried out in the A. E. F. with remarkably good results."

The following points must be borne in mind in performing citrated blood transfusions —

"(a) The recipient must be carefully typed.
"(b) The donor must be carefully typed and if time permits a Wassermann reaction done.

"(c) Only donors of the same or higher types than the recipient shall be used.

"(d) Blood is a fragile tissue, the processes of coagulation begin almost instantly when the blood leaves the vein, therefore, the blood must pass quickly, easily and cleanly into the sodium citrate solution and be immediately mixed with it before coagulation begins.

"(e) Having obtained the blood and having carefully mixed it with sodium citrate, the process of administering it to the recipient may be carried out much more leisurely than in other methods, the problem of coagulation having been eliminated."

If known types are not available the following method of determining compatibility may be used —

"Draw the blood from the recipient as for a Wassermann reaction. Allow to clot and the serum to separate. Pipette off the serum and centrifuge until clear. Add normal sodium citrate solution (3.8 per cent) in the proportion of one part to ten parts serum.

'Use this as a type serum. Mix it with blood from donors as before, rejecting those that agglutinate."

Drawing of blood — The apparatus required is as follows —

A graduated 1,000 c.c. flask drawn out at one end to fit a short rubber tube about 2 inches in length.

A short clean needle, 14 to 16 gauge.

A long glass stirring rod.

Procedure — The usual procedure for puncturing veins is adopted. The needle may be introduced directly into the distended vein (Median basilic) or through a small transverse incision. 50 c.c. of freshly made sterile isotonic sodium citrate solution (3.8 per cent) is introduced into the apparatus before puncture. The blood is allowed to rise in the flask while an assistant stirs the citrate solution in.

50 c.c. of the citrate solution is sufficient for 500 c.c. of blood. If more or less blood is required the amount must be increased or decreased in proportion.

Introduction of blood — The same flask filled with the citrated blood is used. This is attached to a 19 or 20 gauge needle by a rubber connecting tube 3 feet long with a glass window near the distal end. The blood is allowed to flow in by gravity. It is a good practice to stop after 30 cm. have been introduced to note possible symptoms of haemolysis. These are —

(a) Shortness of breath, (b) intense flushing of the face sometimes with urticaria, (c) pain in abdomen or back, (d) vomiting. According to the writer haemolytic reactions are rare. Slight chills occurred in a small percentage of the cases.

The advantages of the citrate method are summarized as follows —

"(a) The whole apparatus may be sterilized by boiling and may be used repeatedly. I have performed four transfers of blood in one afternoon with a single apparatus. Following each transfer the apparatus was washed in cold water and re-boiled. No further preparation is required.

"(b) In drawing the blood if there is clotting in the needle a new one may be substituted without losing or harming the blood already drawn.

"(c) Citrated blood will keep several hours if necessary

"(d) The blood may be drawn in the operating room, carried to the ward in the flask and there introduced into the patient

"(e) The therapeutic results as compared with other methods of transfusion are identical

"(f) The whole operation may be done easily, surely and without haste

"(g) The blood may be administered through a very small needle without incision, which is of value in hemorrhagic patients who often bleed from the wound"

Further Studies on the Use of Water-Soluble B in the Treatment of Infant Malnutrition

From the Society of the New York Hospital, New York—By WALTER H EDDY

RESULTS of experiments were reported confirming previous work of the author in stimulating growth by the addition of B vitamin extract to the diet of infants suffering from malnutrition of the marasmus type. A new feature used in the study was the application of the Bachmann test to measurement of dosage.

In experiments with vitamin prepared from the navy bean by the McCollum method the test detected relatively small amounts of vitamin and while in need of further standardization, offered a valuable aid in measurement of the vitamin B present in the substances used. Tables were shown giving the result of the test on various amounts of the dextrin-vitamin mixture and on other substances such as milk, both cow and human milk.

The first case, showing stimulation with the B vitamin gained an average of 0.84 ounce per day in a 32-day period as against a gain of 0.47 ounce per day during 17-day period preceding the use of the vitamin through the calorie intake and the food given remained constant through both periods. The second case showed a similar stimulation though not so well controlled as the first. The interesting feature of the use of the Bachmann test as applied to the first case was the result of the tests as applied to the child's diet and to the extract. The diet was found to contain 2,120 units of vitamin and the stimulating mixture only 70 units. In other words, an increase of only 3 per cent in actual vitamin intake produced the marked stimulation. The author suggested that this result may be due to the fact that the child could utilize the vitamin in the diet and that the way the vitamin is held in a diet may be an important factor. In all the baby cases treated the extract feeding is followed by an increased growth, which continued to a point where removal of the extract is possible without marked reduction in the growth rate, and the child then goes on to recovery.

These cases represent the fifteenth and sixteenth showing stimulation under this treatment—*The Journal of Biological Chemistry* Vol XLI No 3

Preliminary Observations on the Relation of Bacteria to Experimental Scurvy in Guinea-pigs

From the Research Laboratories, Western Pennsylvania Hospital, Pittsburgh—By MAURICE H GIVENS and GEORGE L. HOFFMAN

Whether or not bacteria play any rôle in the development of scurvy in guinea-pigs has not been settled by direct evidence. Jackson and Moore found coccus-like bodies in microscopic sections of lesions in scorbutic guinea-pigs. Jackson and Moody isolated from the diseased joints, muscles, and lymph glands of these animals gram-positive and gram-negative organisms. Pure strains of these bacteria introduced into guinea-pigs gave rise in most instances to hæmorrhagic and other lesions in the bones, joints, muscles, lymph glands, and organs. Torrey and Hess concluded that scurvy, both of guinea-pigs and of infants, was not associated with an overgrowth of putrefactive bacteria in the intestinal tract.

We have attempted to throw further light upon the question by bacteriological examinations of the blood, joints, and feces of guinea-pigs made scorbutic on different diets and then treated with different antiscorbutic foods. Blood from scorbutic animals anesthetized and from those dying of the disease regardless of the diet producing the same has been found to be sterile. The enlarged front joints of guinea-pigs developing scurvy on oats alone were sterile, this was likewise true in the majority of cases of guinea-pigs developing scurvy on the soy cake food of Givens and Cohen. However, in two or three instances a staphylococcus and diplococcus were isolated. Pure strains of these organisms injected intracardially, intraperitoneally, and into the joints of healthy guinea-pigs on a mixed diet produced no signs of scurvy. Smears and cultures were made of material from different parts of the intestinal tract of guinea-pigs on oats alone, on oats plus lemon juice, 3 cc daily, after scurvy developed, on the soy cake diet, and on the same plus cabbage after the appearance of scurvy. No marked difference was found in the intestinal flora under any of these conditions—*The Journal of Biological Chemistry* Vol XLI No 3

The Rôle of Fat-Soluble Vitamin in Human Nutrition and its Suggested Relation to Rickets

From the Bureau of Laboratories, Department of Health, New York—By ALFRED F. HESS

It has been shown that the fat-soluble vitamin is an essential constituent of the dietary

of rats There have also been clinical reports attributing marked malnutrition in infants and children to a lack of this dietary factor (Japan, Denmark) As a result of these experiences it has been accepted that this vitamine is highly important for man, and that the lack of it leads to nutritional disorder in children This has been emphasized all the more as this vitamine is not nearly so widely distributed in nature as is the water-soluble vitamine In order to study this question five infants, varying in age from 5 to 12 months were given a diet which was complete except for a very small amount of fat-soluble vitamine It consisted of 180 gm daily of highly skimmed milk ("Krystalak" 0.2 per cent fat), 30 gm of cane sugar, 15 to 30 gm of autolysed yeast (to supply water-soluble vitamine) 15 cc of orange juice, 30 gm of cotton-seed oil, and cereal for the older infants

On this diet the children have done well for a period of 8 to 9 months They have shown no anæmia, no eye trouble, no bone changes, as seen by the X-ray, nor has their growth in length or in weight suffered We believe, therefore, that either a very small amount of this vitamine suffices to supply the needs of human nutrition, or that this deficiency has to be maintained for a period of years in order to bring about any harmful result Danger from a lack of this dietary factor need not be apprehended if the diet is otherwise complete

The development of rickets has been attributed by Mellanby, as a result of experiments on dogs, to a lack of fat-soluble vitamine and Hopkins and Chick have termed this vitamine the "anti-rachitic factor" It was found, however, that infants fed on this "fat-soluble vitamine minimal diet" did not develop the well-established signs of rickets—beading of the ribs, enlargement of the epiphyses, the weakness of the muscles, etc We cannot believe, therefore, that rickets is brought about merely by a deficiency of this principle, all the more so, as this disorder developed in infants receiving large quantities of milk containing ample fat-soluble vitamine It may be added that neither cream nor the leafy vegetables, both of which are rich in this principle, are comparable to codliver oil as growth stimulants—*The Journal of Biological Chemistry* Vol XLI No 3

The Etiology of Rickets

From the Laboratory of Chemical Hygiene, School of Hygiene and Public Health, the Johns Hopkins University, Baltimore—By E V McCOLLUM, NINA SIMONDS and HELEN T PARSONS

"We have conducted an extensive series of experiments with rats restricted to diets derived from cereals and legume seeds, cereals, legume seeds, and muscle meats, and with similar diets in which degerminated products of cereal

grains replaced whole seeds, and have supplemented these mixtures with purified food substances to determine the nature and extent of their dietary shortcomings

In these experiments we have observed the gross picture of rickets in many of the animals restricted to faulty diets, and have demonstrated that this condition develops on diets in which the faults lie in several different factors

A low content of fat-soluble A, low calcium content, poor quality of protein, and unsatisfactory salt combinations, acting in combinations, may all contribute to the etiology of the disease We have not yet completed our observations on diets in which but a single factor is at fault It is certain that specific fasting for fat-soluble A cannot be regarded as the sole and only possible cause of rickets

Since the same gross picture can be induced in several different ways, we are led to suggest the possible occurrence of more than one kind of rickets Histological studies of tissues of animals suffering from what appears to be rickets, but from different causes, are still in progress No decision can yet be reached as to whether in all cases the histological picture is the same in animals exhibiting beaded ribs, enlargements of the costochondral junctions, deformity of the thorax, and general deformity of the body, irrespective of the dietary factor or factors which brought about the condition—*The Journal of Biological Chemistry* Vol XLI No 3

"The Control of Hæmorrhage by Intramuscular Injection of Calcium Chloride

Guy's Hospital Gazette, p 159—W R GROVE

THE value of the salts of lime in increasing the coagulability of the blood is well known, but it is not so well known that their absorption from the intestine is very slow and minute Professor Dixon pointed this out, saying that practically all the salt could be recovered from the fæces, and he suggested its hypodermic use in a dose of one grain In a troublesome case of hæmoptysis the writer gave in the forearm a grain of calcium chloride diluted with 20 minims of water The result was immediate and perfect, but a patch of gangrene of the size of a sixpence developed at the site of injection, which sloughed away and gradually healed The patient, rid of his hæmoptysis, thought the scar a small price to pay

The writer has always at hand a 1 in 4 solution of the fused calcium chloride In hard water there is a precipitate, but this is shaken up and 4 minims of cloudy fluid are drawn into the syringe and boiled hot water is drawn up afterwards to the 20-minim mark This is injected deeply into the gluteal muscles The injection is painless

In hæmoptysis the injection always acts like a charm, and so certain is the result that when pressed for time the writer assures the friends that the bleeding will stop and tells them not

to expect to see him for two days, unless they send. In all cases of hæmorrhage when it is impossible to reach the bleeding spot the injection is invaluable. In hæmatemesis it has acted in the same way. In certain cases of metorrhagia it has been useful, and good results have been obtained after the oral administration has had no effect. After abdominal hysterectomy in an extremely fat woman there were signs of peritoneal hæmorrhage with collapse distension, and oozing from the incision, and presumably a ligature had slipped. The surgeon could not easily be got at but after an injection of calcium chloride all the symptoms gradually subsided, and she recovered without the wound having to be opened up. In a case of aortic aneurysm two injections were given, at about a fortnight's interval. The patient is apparently getting better since the bruit has almost disappeared and the dulness is decreasing. In many other cases the method may prove useful, e.g., when the diagnosis of a ruptured extra-uterine pregnancy is made in the anxious time before operation, in typhoid hæmorrhage, in anticipating secondary hæmorrhages, in war work, and as a preparation for certain operations. The writer always keeps a small bottle in his emergency and midwifery bags.

One warning—once one of the writer's house-surgeons, out of his imperfect memory, injected 10 grains instead of one, producing a terrible femoral thrombosis and gangrene. But with one grain as the dose no harm has resulted."

VICTOR PAUCHET, in the *American Journal of Surgery*, 1920, 34, 1, notes that spinal anæsthesia improves the prognosis in cases of intestinal obstruction, since it causes intestinal contraction, releases the abdominal wall and does not cause vomiting. In his opinion, it should *not* be employed in cases for which local anæsthesia is sufficient—varicocele, hæmorrhoids, perineorrhaphy, prostatectomy, goitre, cancer of the tongue, osteotomy of the femur and amputation of the foot, etc., being reserved for major operations. He believes that plugging the patient's ears and blind-folding him are useful preliminaries, joined with the injection of scopolamin-morphine and a cardiac stimulant one hour before the operation. If the tension be low 10 c.c. of fluid may be withdrawn, if it be high 25 to 30 c.c. should be taken—the first few drops being allowed to flow into the ampoule containing the anæsthetic powder. The dose of anæsthetic required varies with the operation, the quantities being in the ascending scale for foot, thigh, acromioclavicular joint, uterus, stomach, kidney, liver, from one-third to a whole ampoule corbiere, which contains 0.6 gr. procaine with 0.3 gr. cocaine.

3 c.c. of the prepared solution are injected, then the cerebrospinal fluid is again aspirated and again injected and so on to ensure thorough diffusion, which is aided by making the patient

cough. The injection should be made slowly—and should take several minutes. First the skin and then the underlying tissues down to the vertebral column are infiltrated with 1-200 solution of procaine—when this is done a large needle may be used for the spinal puncture without causing any pain. The seats of puncture are in the middle line (a) between the 12th dorsal and 1st lumbar vertebrae—the spot being on a line uniting the lower borders of the 12th ribs, (b) between the 2nd and 3rd lumbar vertebrae, and (c) between the 5th lumbar vertebra and the sacrum—this is the largest space, and there is no chance of wounding nerve tissue if the needle be thrust in the middle line.

In hysterectomy for uterine cancer, as the operation is likely to last a long time, the abdominal wall should also be anæsthetised by infiltration of an area of the width of the thumb from the umbilicus to the pubes. For this a 1 per cent solution of the hydrochloride of quinine and urea is used, and has the advantage of causing loss of sensation of the part which lasts several days, thus adding to the patient's comfort after operation. The skin cicatrix will be indurated for a long time, but this does not matter—and can be bettered by the patient massaging the part with her fingers later.

In Pauchet's opinion, surgeons who prefer general anæsthesia to spinal anæsthesia for Wertheim's operation are wrong. The dangers are the same, but the operation is easier under spinal anæsthesia because the abdominal wall is well released, the abdomen is quiet, and the patient does not push out her intestines by straining. In cases of uterine cancer the mortality is lower with spinal anæsthesia because the operation can be done more easily and more thoroughly.

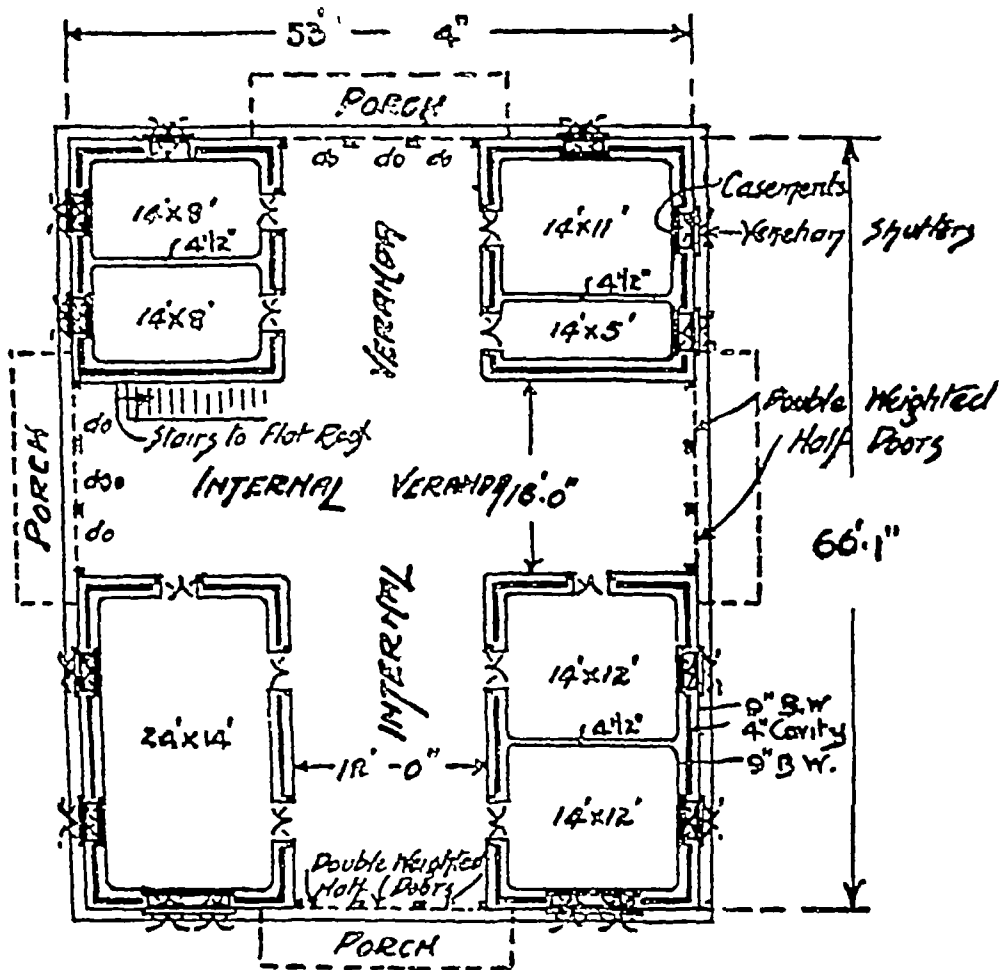
Burn-blebs and their treatment—Ziegelman and Mangan recommend that the blebs should be carefully aspirated and then filled with a 4 per cent solution of sodium bicarbonate. The blebs may again be aspirated and refilled after 4 to 8 hours. Great care must be taken not to break the skin, and if dressings be required, the bleb should be covered with ambrine, or the dressings should consist of paraffin gauze. They point out that the serum contained in burn-blebs is toxic, and must be removed (*Am Journal of Surgery*, 1920, 34, 10).

Incomplete abortion—King points out the utter impossibility of sterilising the vagina and cervix, and the consequent danger of using the curette in cases of incomplete abortion. He uses a sponge-forceps to remove the uterine contents, and then by its means introduces a sponge which is twisted round the uterine cavity to bring away anything that may have been left. As an indication that all has been brought away the cessation of bleeding is valuable. Should bleeding persist, as it does in rare cases,

the canal is picked otherwise nothing is done—no douches, no chemical applications. "The after-treatment is simply rest, local and general for three to six days. The patient is allowed up as soon as the uterus has involuted well and she is discharged two or three days later"—(New Orleans Med and Surg Journal 1920, 7, 540)

In the *Annals of Tropical Medicine and Parasitology* (1920 13 pp 313-336 and 351-412) there are articles on the metabolism of white races living in the tropics and tropical Australia and its Settlement, which are well

the skin and its coverings, was carefully estimated by two thermometers, wet-bulb and dry-bulb, which were prevented from touching the skin by being enclosed in a small wire cage, and the results corroborated Rubner's remarks that a clothed man always lives in a tropical climate as far as his body is concerned. Incidentally it was found that the temperature in the rectum was, in the hot season, between 98.8 degrees and 99.4 degrees F and in the cool season between 98.2 degrees and 98.7 degrees F when the subject was at rest indoors, out of doors the rectal temperature ranged between 98.6 degrees and 99.7 degrees F, and when walking and carrying a load of 13 kilos for fifteen min-



C.D. LYNCH
ARCHITECT

worth reading. In the first article Young details elaborate experiments made to ascertain the influence of external temperature and the rate of cooling upon the respiratory metabolism. Carried out as these experiments were on persons actually living in the tropics, they have much more value than any experiments carried out under artificially produced "tropical" conditions. The skin-shirt temperature, i.e., the temperature of the layer of stagnant air between

utes on the flat at the rate of three miles per hour, it went up to 100.2 degrees F.

The loss in body weight during walking exercise when the dry-bulb registered 87.8 degrees F and the wet-bulb 79.7 degrees F after an hour's walk was 740 g—solely due to profuse perspiration. This, Young says, and we agree with him, shows how necessary it is to supply the body with sufficient water in the tropics. Years ago, we heard an old *shukari*

asseverate that the less water one drank the better when one was after tiger in the hot weather. He may have suffered but little inconvenience from acting on this precept, we found it to be physically impossible to cut down the quantity of fluid ingested, and remain fairly comfortable during the process. We found that, however grateful to the palate and gullet iced drinks might be as thirst-quenchers, they were inferior to *very hot weak* tea, sipped by teaspoonfuls, which had the additional merit of permanently removing the disagreeable bitter taste that was produced by the profuse loss of water through the skin.

Commenting on the physiological changes produced on the white man by residence in the tropics, Breinl and Young express their disappointment at the scrappy nature of past observations and their unscientific basis. But they do accept *neurasthenia*, varying from inability to concentrate attention on one's work up to uncontrollable outbreaks of temper, as a real and fairly frequent result of long residence in the tropics. They believe that it begins by increased output of energy consequent on the stimulation conveyed by the new and strange environment, that thus the energy capacity becomes overdrawn, and that by the time that the newcomer realises that he cannot do the same amount of work in the tropics as he did at Home, the mischief has been done. Combined with this, the monotony and discomfort of life and climate, the lack of pleasures and excitement, and the long distances from centres of civilisation, act to increase the condition. We recommend the perusal of this article to those who, for reasons best known to themselves, do not wish to believe in the existence of tropical neurasthenia, but prefer to view outbreaks of *Tropenkoller* as evidence of mere bad breeding.

They give a plan, devised by Mr C D Lynch, of a house for the tropics, which merits the serious attention of architects and officials of the Public Works Department in India. It is built of reinforced concrete or brick, and has *double outer walls*, between which is a three-inch air-space, suitably ventilated, which obviates the necessity of verandahs. The floor space has a cross-shaped central room on to which open other rooms. We give here the sketch—which makes one feel that those who are now thinking of building flats in Calcutta could not do better than imitate it.

An Appeal for Living Specimens of Fly Maggots from Cases of Cutaneous and Intestinal Myiasis in Man.

MAJOR W. S. PATTON, I.M.S., Director, Pasteur Institute of Southern India, Coonoor, sends the following appeal for publication—

'It is well known that many flies, especially the familiar blue and green bottles and the large 'grey,' striped, flesh-flies deposit either their eggs or living maggots in the human body

under certain conditions. This most often happens when there is an existing open sore, such as ulcers of all kinds, cuts and abrasions, etc., on any part of the body, offensive discharges from the nose, mouth and ears also attract these insects. The maggots burrow into the tissues and cause extensive damage, especially in such situations as the scalp. Others again gain access to the intestinal tract through food, and may lead to obscure intestinal disorders, in this case the maggots are passed out in the *fæces*.

It is of the utmost importance that we should have accurate information regarding the species which cause these painful conditions, and this can only be accomplished by collecting living specimens of the maggots. The writer appeals to all medical officers, who alone have the opportunity of seeing these cases, to send him specimens of the living maggots together with a short note of the case.

When maggots are discovered in sores, etc., it is usually the custom to apply such fluids as chloroform, turpentine, etc., in order to get them out of the tissues and at the same time to destroy them. Before doing this, would all medical officers who come across such cases please send some living specimens of the maggots to the writer? They should be carefully handled so that they may not be damaged and placed in a small tin with some moist earth, the lid of the tin being perforated with fine holes to admit air, the tin should be nearly filled with earth so that the contents may not be subjected to too much movement during transit. The tin should be securely packed and sent at once to the writer. All dead specimens should be pickled in 80 per cent alcohol, as these are of some help in identifying the genus to which the fly belongs. It should, however, be clearly understood that the species can only be identified by *hatching out the fly*, and this is only possible with *living material*. The writer will be glad to send any medical officer who is willing to collect specimens suitable tins and tubes containing 80 per cent alcohol, and will also give any further information which may be desired.

Notanda Passim.

In a recent murder trial the Lord Chief Justice of England upheld the theory that it is the law and its exponents who alone are competent to decide the question of the sanity of an accused person. Of course, this is nonsense. The lawyers, whether at the Bar or on the Bench, are quite as unfit to deal with the subject of mental disorder as is the man in the street. By training and bent the legal mind rests on authority. The older the authority the better, instead of the more likely to be in error, as it is. The notorious pronouncement in the Macnaghten case has warped the minds of the gentlemen of the long robe, so that they cannot see that a "learned" judge in a case concerning mental soundness is just as much in need of skilled assistance as if he were trying a case of collision on the high seas. In the latter case he would be helped by technical experts. In the former he has to rely on his own ignorance, and, what is worse, on his ignorance that he is ignorant of the subject.

Here in India we have found much more intelligent appreciation of medical evidence in such cases than is met with at Home. What the reason for this may be we leave to our readers to guess.

In the April number of *Science Progress* the Editor, Sir Ronald Ross, has a good note on Awards for Medical Discoveries. Exceptionally lucky as he has been, he pleads the cause of his less fortunate brethren and pleads it well. But in the same number he has written a railing article against the State for its neglect to act on his advice and compass the elimination of malaria from the earth. Obviously he hopes that this railing will not fall on deaf ears else he would not have taken the trouble to set forth his grievances. We do not feel sanguine as to the result for those who "govern" all nations are not concerned with the things that really matter. Politicians have no time for anything that is not likely to tickle the palate of the ignorant voter, and by so doing tend to keep them in Place and Power with their corollary Pelf. They are all instructed half-educated men who do not lead but are pushed this way or that by the capricious crowd. Some day—centuries hence—the average man will have received a real education and will insist on being governed by an oligarchy of the aristocracy of intellect. Then no suggestion made by a man of science will be "turned down" merely because it is not likely to catch and keep votes. Then selfishness will be a crime, being against the clear purpose of Nature to preserve the species at the expense of the individual numbers thereof.

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G R CLARKE,

Director-General of Posts and Telegraphs
CALCUTTA, *The 15th April, 1920*

Reviews.

CLINICAL METHODS—By G T BIRDWOOD, M.A., M.D., D.P.H., *Lieut-Col R.M.S.* Third Edition. Calcutta 1920. Thacker, Spink and Co. Price Rs 7-8.

THE third edition of this handy *vade mecum* contains much more information than did even the second edition, which sold so well, because it was found to be of great use to workers in the mofussil. All that it contains is accurate, which is the best praise that can be given to a work of its kind. When he has this work with him, the practitioner will never be at a loss how to deal with many of the important matters which crop up each day in Indian practice.

PRACTICAL PHARMACOLOGY FOR THE USE OF STUDENTS OF MEDICINE—By W E DIXON, M.A., M.D., F.R.C.S. Cambridge, 1920. University Press. Price 7s 6d net.

THIS little work is a guide to the performance of easy experiments which illustrate the

actions of drugs in common use. It does not, unfortunately, deal with decerebrate mammals, but is of use nevertheless for the student will learn much concerning the real, as distinguished from the supposed, action of drugs that he will not readily gather from more pretentious works.

THE SEXUAL DISABILITIES OF MAN—By ARTHUR COOPER. Fourth Edition. London, 1920. H K. Lewis and Co. Price 10s 6d net.

THE author of this book may be congratulated on having made a laudable attempt to reduce to a small compass a very large and complex subject. The first part of the book is devoted to a detailed account of the morbid conditions of the human semen and to the treatment of sterility. Part II deals with sexual impotence. The author starts by defining impotence as an "inability to perform the normal sexual act," a definition which lacks a good deal of precision and would certainly not include certain forms of psycho-sexual impotence. The definition would be improved were it made to read, "a complete or incomplete inability satisfactorily to carry out the act of *coitus per vaginam*."

The author then proceeds to divide impotence into primary and secondary. Under the latter heading he tabulates the causes of impotence which are characterised by "some definite preceding morbid condition, general or local," *vis*, induration of the penis, varicocele, diseases of the central nervous system, phthisis, malaria, X-rays, etc., etc. Primary impotence is defined as impotence for which no such cause can be found, *ie*, no preceding morbid condition, general or local. It is, therefore, somewhat of a surprise to find among the causes of primary impotence references to certain morbid conditions of the mind. One is led to conclude that "a morbid condition" connotes to the author solely a morbidity of the tissues of the body, although he does cite "neurasthenia" as a cause of secondary impotence. The conclusions reached on p 115 in relation to overwork as a cause of impotence are far from convincing, and they become all the less so by the citation of the case of Sir Isaac Newton in support of them. The author appears to have overlooked the fact that Newton, apart from his stupendous genius in a special field, was an incomplete and unsatisfactory human being, who ultimately reached a condition near akin to insanity. We think, indeed, that the subject of psychical impotence does not receive very clear or satisfactory treatment from the author. For no mention is made of the most important single cause, which may well be called *the* specific cause, of psycho-sexual impotence, namely, *unconscious* incestuous fixation, dating from early childhood, which results in many men being impotent with the woman they love, but able to develop high sexual capacity and pleasure with an inferior woman in whose society ethical and æsthetic scruples need not be

considered, and with one who is a complete stranger. In his remarks on the treatment of psychical importance the author discloses the light-hearted optimism of the surgeon, in a way that might well stagger the work-a-day psychotherapist.

Under the heading of Prevention of Impotence, the author discusses shortly the problem of how best to explain sexual matters to children, especially to boys, and he refers to instances where the teaching of "Sex Hygiene" has not met with success, both in America and in Great Britain.

The subject is admittedly a very complex one, and it may lead in time to a reconsideration on the part of so-called civilised man as to whether or not he would do well to imitate the example of certain primitive races, whom he is now pleased to despise, by instituting ceremonies of initiation into manhood which involve not merely education in the ordinary sense, but a stern discipline of the character, feats of endurance, the trial of character—in short, the testing of the muscles of the soul as much as of the body. At present no such instruction has found a place in the curriculum of any school in Europe or America. The chapter devoted to Venereal Diseases contains views of the author that are both moderate and thoroughly sensible, so that one could wish that he had found it possible to prolong his discussion of this aspect of the sexual disabilities of man. Similarly on the subject of continence he has some quite sound observations to make, although he appears to make the very common mistake of failing to emphasise the biological fact that the act of healthy sexual union is the satisfaction of the erotic needs, not of one person, but of *two* persons. The postscript on "Sexuality and War" does not represent much else than a collection of somewhat *ex cathedra* utterances on the part of a few more or less well-known medical men, and the opinions expressed are frequently contradictory. The book is of a handy size and is furnished with satisfactory indices of authors and subject-matter.

THE AFTER-TREATMENT OF SURGICAL PATIENTS—By WILLARD BARTLETT, A.M., M.D., F.A.C.S., and Collaborators. Vols I and II, pp 1066, 222 original illustrations and 1 coloured plate in Vol I, and 213 original illustrations in Vol II. St. Louis, 1920. C. V. Mosby Company. Price \$10.00.

THE two volumes of this book contain a considerable store of surgical information, based on the personal experience of the authors of work done in the Mayo Clinic, and on extracts from the works of many well-known authorities. The After-Treatment of Surgical Patients is dealt with in a much more ambitious way than in most books of this type. Take as an example the excellent chapter on Fat Embolism by O. F. McKittrick: before the actual lines of treatment are discussed, the history of this complication is gone into, its pathology described, and the surgical operations which most

commonly produce it are mentioned. A bibliography completes most chapters.

Most of the surgical advances made during the war are alluded to, though we would have liked to have seen the subject of fractures more fully dealt with. The illustrations are numerous and excellent and many useful devices are shown.

We congratulate the authors on producing a work which will be of great value to senior students and to all surgeons. Every Civil Surgeon in India will find a copy valuable, particularly those associated with large hospitals.

Our only criticism is that the volumes savour too much of compilation and there is some lack of balance in dealing with the more important and less important sections. There are many minor points that some would criticise, but it is as well to remember that a book on surgery depicts a constantly shifting scene in which individual opinions and endless research must always play their part.

Correspondence.

To the Editor of THE INDIAN MEDICAL GAZETTE

SIR,—In the February number of *The Indian Medical Gazette*, of the current year, there is an extract headed "An Amplification of Young's Rule," in which it is said that Young's Rule is inadequate in the case of infants, *vide* page 65.

My contention is that it is not so, and there can be no real difficulty if the prescriber takes a little trouble to make his mental calculations in fractions. What has been put forward as a modification or amplification by Cloud is in reality Young's Rule in disguise, only the mathematical calculation has been shown in a simplified form. Let us calculate from the example cited by Cloud, *et c.*—

(1) At five months, the dose will be—

$$\begin{aligned} & \frac{5}{12} \text{ yr} \times 12 = \frac{5}{12} \\ & = \frac{5 + 144}{12} = \frac{149}{12} \\ & = \frac{149}{12} \times \frac{12}{5} = \frac{149}{5} = 30, \text{ i.e., } \frac{1}{30} \text{ approx} \end{aligned}$$

(2) At 16 months, the dose is—

$$\begin{aligned} & \frac{16}{12} \times 12 = \frac{16}{12} = \frac{16}{12} \times \frac{144}{16} \\ & = \frac{160}{16} = 10, \text{ i.e., } \frac{1}{10} \end{aligned}$$

Therefore, where is the difference? So we can neither accept it as an amplification nor as a modification of Young's Rule. We can at best call Cloud's method a simplification of mathematical calculation, nothing more.

Yours, etc.,

R. K. BHATTACHARYYA, M.B.

NABADWIP, 1st May, 1920

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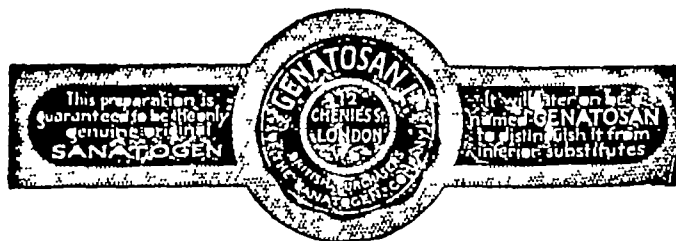
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SUBJECT to His Majesty's approval the services of temporary Captain J Nasarwanji Hormasji Choksy are dispensed with on account of medical unfitness with effect from the 25th December, 1919

To be Honorary Surgeon to H E the Viceroy
LIEUT COL. P W SUTHERLAND, CIE, MD, IMS,
vice Brevet Col R Heard, MD, IMS, appointed Surgeon to H L the Viceroy

To be Surgeon to H E the Viceroy
BREVET COL. R HEARD, IMS, vice Lieut-Col H A Smith CIE., MB IMS, appointed Inspector General of Civil Hospitals, Bihar and Orissa

In the notification in the *London Gazette* dated 1st December 1916 making certain promotions in the I M S for "24th July 1914" above the names of Edward Randolph Armstrong MB., and Charles James Stocker, MB read "29th July, 1914"

In exercise of the power conferred by section 10 of the Indian Universities Act 1904 (VIII of 1904) His Honour the Chancellor of the Allahabad University is pleased to nominate the following gentlemen to be ordinary fellows of the said University —

1 Lieut Col W Young, MB., CM IMS Civil Surgeon Lucknow

2 Major W R C MacWatters MB F.R.C.S. IMS, Professor King Georges Medical College Lucknow

CAPT L. A. P ANDERSON, IMS., Military Medical Officer Allahabad, to hold civil medical charge of the Allahabad district in addition to his military duties during the absence on privilege leave of Lieut-Col R G Turner, CMG DSO, IMS

CAPT E. S PHIPSON DSO, MB IMS is confirmed in the appointment of Health Officer Simla with effect from the afternoon of the 13th October 1918

The following appointment is made with effect from the date specified —

Major H C Keates, IMS Civil Surgeon on general duty, Mayo Hospital, Lahore, with effect from 31st January, 1920 (forenoon)

The undermentioned officers are permitted subject to His Majesty's approval to resign their commissions with effect from the dates specified —

Temporary Captain Gilbert Eugene Paul Dated 10th December 1919

Temporary Captain Bhumonjee Nowrojee Burjorjee Dated 14th February 1920

Temporary Captain Hirji Dorabji Gimi Dated 2nd March 1920

Temp Lieut to be temp Capt

R. C WATTS 26th Sept. 1919

MAJOR J MORRISON MB IMS of the Bacteriological Department is granted privilege leave for six months combined with furlough on average salary for two months with effect from the 15th April, 1920 or any subsequent date on which he may avail himself of the leave

MAJOR H B DRAKE IMS, officiating Assay Master, Calcutta, has been posted as officiating Assay Master Bombay with effect from the forenoon of the 15th March 1920 The duties of the Assay Master Bombay for the 13th and 14th March, 1920 were performed by Mr C R Robson BSc Deputy Assay Master, Bombay

The services of the undermentioned officers of the Indian Medical Service are placed permanently at the

disposal of the Government of Madras, with effect from the dates noted against their names —

Major A J H Russell, MD 13th July, 1919

Major A S Leslie, MB 26th July, 1919

Major F C Fraser 26th July, 1919

THE services of Majors Leslie and Fraser will remain temporarily at the disposal of His Excellency the Commander in Chief in India

THE KING has been graciously pleased to approve of the undermentioned rewards on the recommendation of the Government of India for distinguished service in connection with Military Operations in Persia (Bushire Force) Dated 3rd June, 1919 —

To be Brevet Major

Capt (A/Lt-Col) H R B Gibson, MB, IMS

THE names of the undermentioned have been brought to the notice of the Secretary of State for War for valuable services rendered with the Bushire Force in Persia during the period from 1st April, 1918, to 31st March, 1919 Dated 3rd June, 1919 —

Beatson, Captain B F, IMS, Bowle-Evans, Lt-Col (T/Col) C H, CMG MB, IMS, Cameron, Major A MB, IMS, Gibson, Capt (A/Lt-Col) H R B IMS, Halliday Major (A/Lt-Col) H, MB, IMS Jolly Maj (A/Lt-Col) G A., MB, IMS, Joshi T/Capt N, IMS, Khosla, T/Capt R N, IMS, Lapsley Major (A/Lt Col) W, MB, IMS, Mitra T/Capt P N, IMS, Oonwala T/Capt J H, IMS, Rao T/Capt B S, IMS, Singh, (T/Capt) MA, MB IMS

MAJOR J S O'NEILL IMS, Military Medical Officer, to hold charge of the Civil Surgeoncy of Meerut, in addition to his own duties, vice Lieut-Col A W R Cochrane IMS transferred

LIEUT COL. R G TURNER, CMG, DSO IMS Civil Surgeon Allahabad is granted privilege leave for three months with effect from the 15th April, 1920, or subsequent date

LIEUT COL. E J O'MEARA, OBE., IMS, Civil Surgeon and Principal, Medical School Agra, is granted privilege leave combined with furlough on medical certificate for a total period of one year, with effect from the date he may take it

ON relief by 2nd Grade Assistant Surgeon Narbada Prasad Shrivastava, LM&S Lieut-Col A Buchanan MA MD MCh MAO IMS, Civil Surgeon Nagpur is appointed to be Civil Surgeon Pachmarhi, for the half of May and the month of June, 1920

LIEUT COL. W D HAYWARD MB IMS, Medical Store-keeper, to Government Calcutta, is granted combined leave ex India for 8 months i.e., privilege leave for 1 month and 5 days and furlough for the remaining period, with effect from the 2nd January 1920 under the terms of Articles 233 and 241 Civil Service Regulations This office Notification No 1 dated the 17th February 1920 is hereby cancelled

THE KING has approved the retirement of the following officer and the grant of rank as shown below —

INDIAN MEDICAL SERVICE.

Capt. G L C Little, MB F.R.C.S.E., in consequence of ill health 5th February 1920

INDIAN MEDICAL SERVICE.

THE following acting promotion is notified, subject to His Majesty's approval —

Major G G Hirst to be acting Lieut-Col while commanding No 3 Combined Field Ambulance East African Expeditionary Force from the 4th July, 1917, to the 29th July, 1917

SUBJECT to His Majesty's approval, the services of the undermentioned officers are dispensed with, with effect from the dates specified —

Temporary Captain Kumud Behari Chowdhuri Dated 14th March, 1920

Temporary Captain Mohim Lal Deb Dated 20th March, 1920

Temporary Lieutenant Therathawathu Cheriyan Mathew Dated 24th January, 1920

SUBJECT to His Majesty's approval, the services of temporary Lieutenant Vishwanath Hari Bedekar are dispensed with on account of medical unfitness, with effect from the 15th March, 1920

THE undermentioned officers are permitted, subject to His Majesty's approval, to resign their commissions, with effect from the dates specified —

Temporary Captain Dhanjishaw Phirozeshaw Karaki Dated 19th February, 1920

Temporary Captain Francis Barlow Ambler Dated 9th March, 1920

IN exercise of the powers conferred by section 10 of the Indian Universities Act, 1904 (VIII of 1904), His Honour the Chancellor of the Allahabad University is pleased to nominate the following gentleman to be an ordinary fellow of the said University —

The Hon Colonel J K Close, I.M.S., Inspector-General of Civil Hospitals, United Provinces

LIEUT-COL J M WOOLLEY, I.M.S., Inspector-General of Prisons, United Provinces, is granted privilege leave combined with furlough on full average salary for a total period of eight months, with effect from the 1st April, 1920, or subsequent date

IN exercise of the powers conferred by Regulation XI, Clause (a), of the Regulations for the nomination and election of members of the Legislative Council of the Chief Commissioner of the Central Provinces, the Chief Commissioner, with the previous sanction of the Governor-General, is pleased to nominate Colonel C R M Green, I.M.S., to be a member of the Council in place of the Hon Lieut-Col C H Bensley, I.M.S., resigned

LIEUT-COL. R H MADDOX, C.I.E., I.M.S., is appointed to be Civil Surgeon of Hazaribagh, with effect from the 1st March, 1920

IN modification of Government Notification No 1754, dated the 13th February, 1920, Lieut-Col W M Houston, I.M.S., Health Officer of the Port of Bombay, is granted privilege leave for six months combined with furlough on average salary for two months, with effect from the 3rd April, 1920, or the subsequent date of relief

LIEUT-COL. E F G TUCKER, M.B., B.S., M.R.C.P (Lond), I.M.S. is granted with effect from the 1st May, 1920, or the subsequent date of relief, privilege leave of absence for such period as may be due to him on that date in combination with furlough for such period as may bring the combined period of absence up to one year

IN exercise of the powers conferred by clause (b) of sub-section (1) of section 4 and section 10 of the United Provinces Medical Act (III of 1917), the Local Government is pleased to nominate Major J E Clements, M.B., D.P.H., I.M.S., to be a member of the United Provinces Medical Council, *vice* Lieut-Col J M Woolley, I.M.S., resigned

MAJOR C H BARBER, I.M.S., Professor of Medicine, King George's Medical College, Lucknow, to Aligarh as Civil Surgeon

LIEUT-COL. A W R COCHRANE, I.M.S., Civil Surgeon, from Meerut to Agra

LIEUT-COL. E F G TUCKER, M.B., B.S., M.R.C.P (Lond) I.M.S., is granted, with effect from the 1st May, 1920, or the subsequent date of relief, privilege leave of absence for such period as may be due to him on that date in combination with furlough for such period as may bring the combined period of absence up to one year

HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to declare that the furlough for six weeks granted to Major A F Hamilton, M.B. (Lond), F.R.C.S., I.M.S., in Government Notification No 2609, dated the 9th March, 1920, should be considered as furlough on average salary

MAJOR K G GHARPUREY, I.M.S., is granted, with effect from the date of relief, privilege leave of absence for two months and fifteen days

MR D A TURKHUDD, M.B., C.M., Acting Assistant Director, Bombay Bacteriological Laboratory, is granted privilege leave for six months, with effect from the date on which he may avail himself of it

THE GOVERNOR IN COUNCIL is pleased to appoint Major S W Jones, O.B.E., I.M.S., to be Superintendent, Yeravda Central Prison

DR. J F LOBO, L.M.S., D.P.H., D.T.M.S., Health Officer of the Nagpur Municipality, is appointed to be Second Deputy Sanitary Commissioner, Central Provinces, on a pay of Rs 500—25—600, for a period of five years, with effect from the date on which he assumes charge of his duties

CAPT C H FIELDING, I.M.S., to be acting Lieut-Col while commanding an Indian Casualty Clearing Station Dated 12th December, 1919

Captain to be Major

GEORGE FREDERICK GRAHAM, M.D. Dated 1st February, 1920

THE services of Major H R. Dutton, I.M.S., are placed permanently at the disposal of the Government of Bihar and Orissa, with effect from the 4th November, 1919

LIEUT-COL. F P CONNOR, D.S.O., F.R.C.S., I.M.S., Officiating Professor of Surgery, Medical College, Calcutta, and Surgeon to the College Hospitals, is appointed permanently to be Professor of Clinical and Operative Surgery, Medical College, Calcutta, and Surgeon to the College Hospitals, *vice* Lieut-Col. R P Wilson

Notice.

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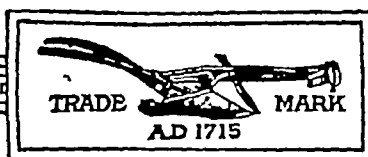
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Academy of Medicine Paris, 10th Nov 1903.

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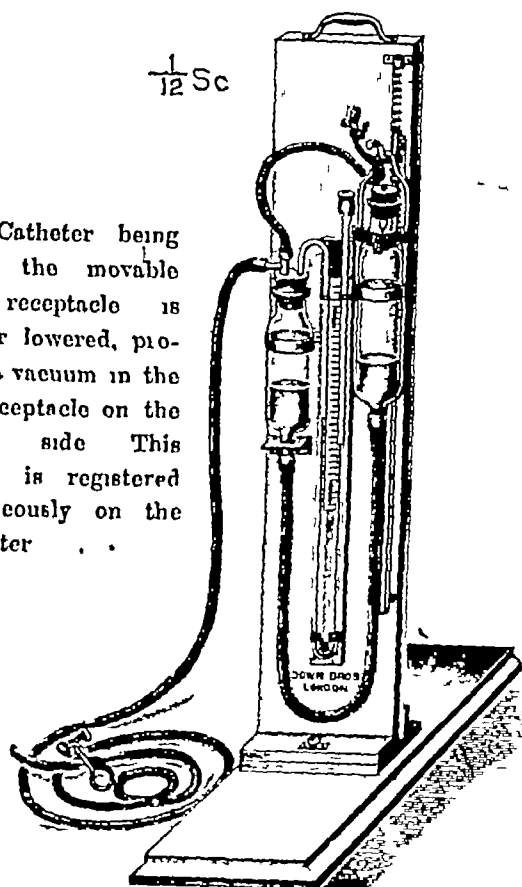
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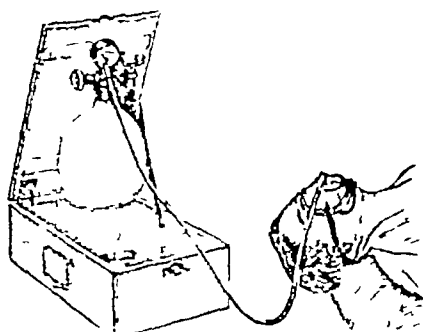


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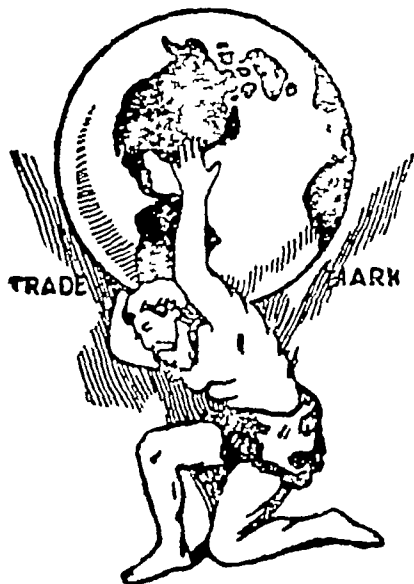
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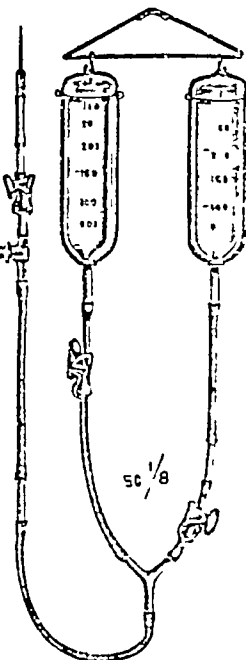
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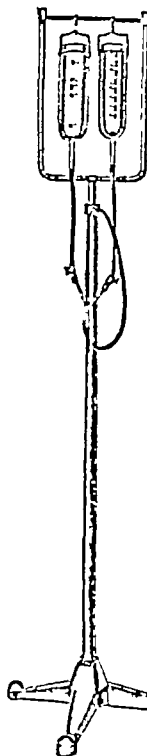
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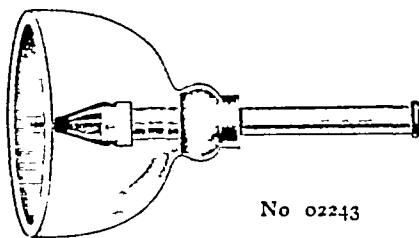


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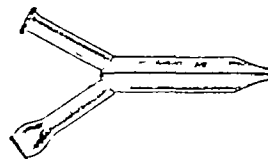
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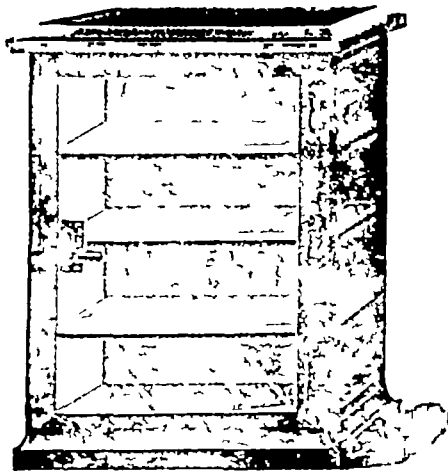


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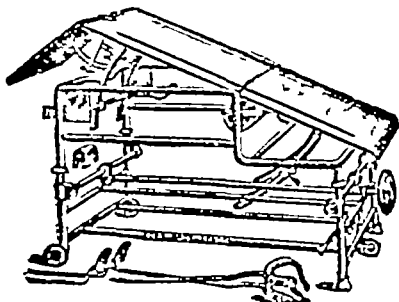
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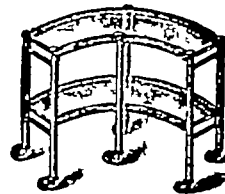
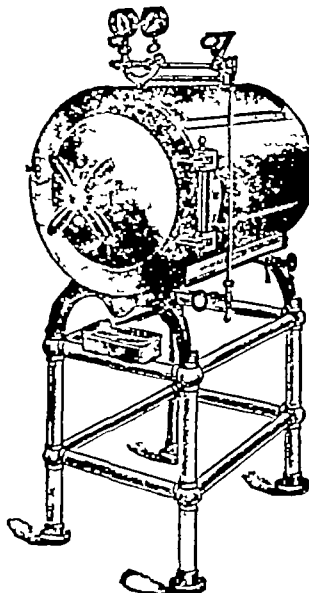


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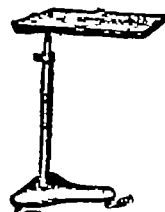


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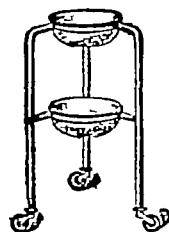


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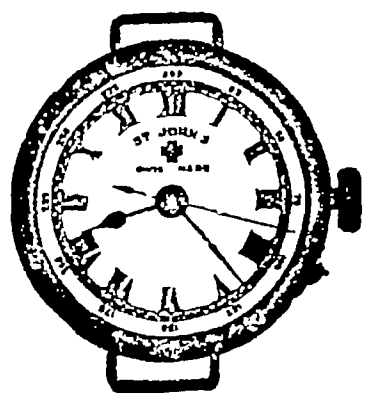
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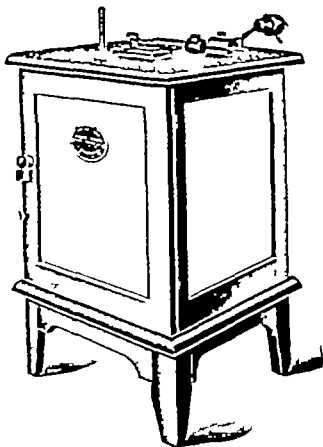
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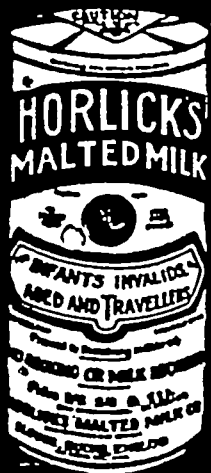
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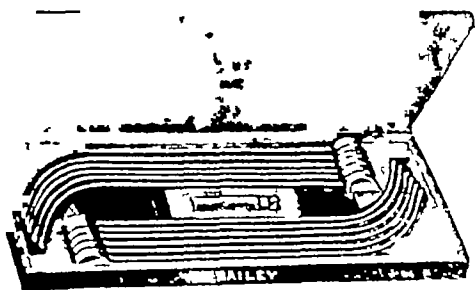
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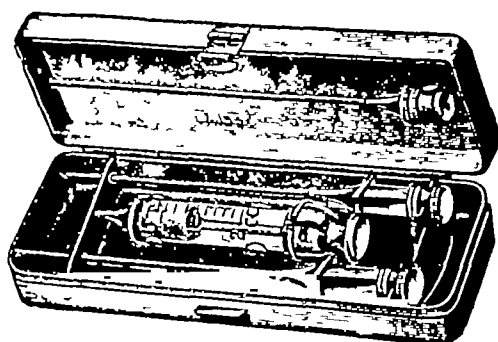
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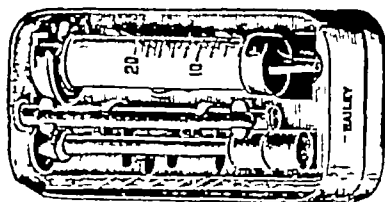
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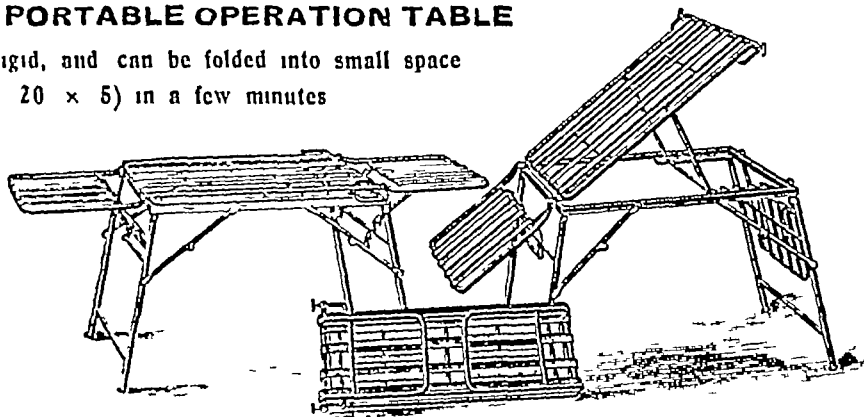
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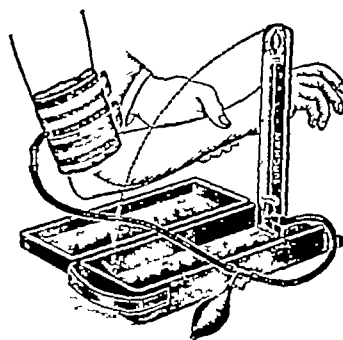
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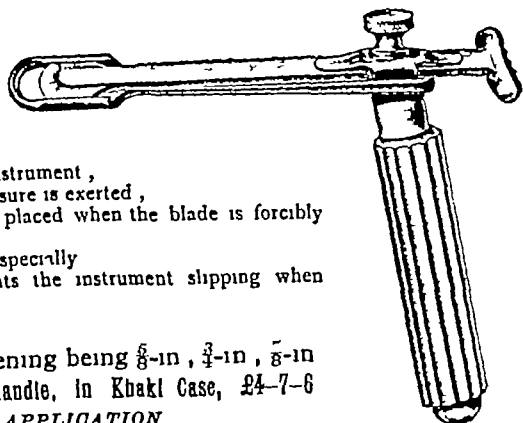
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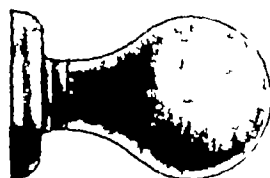
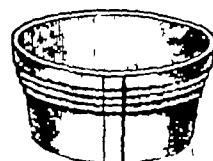
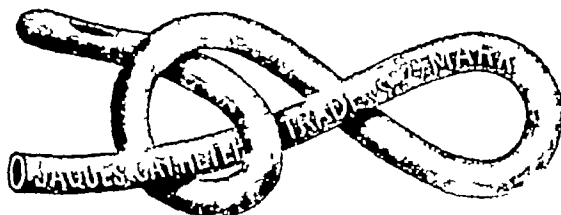
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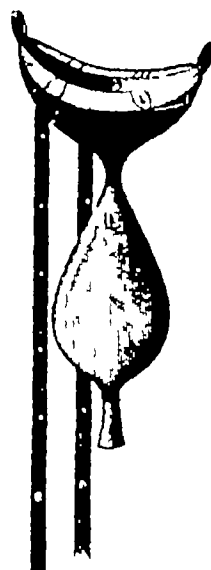
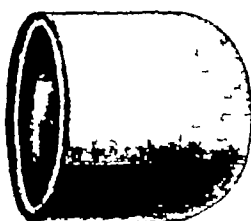


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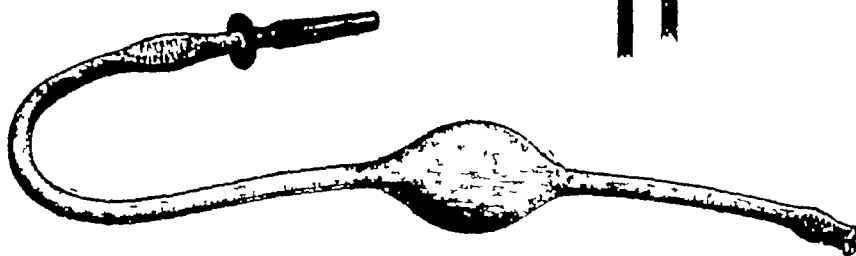
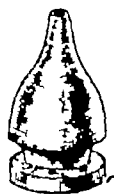
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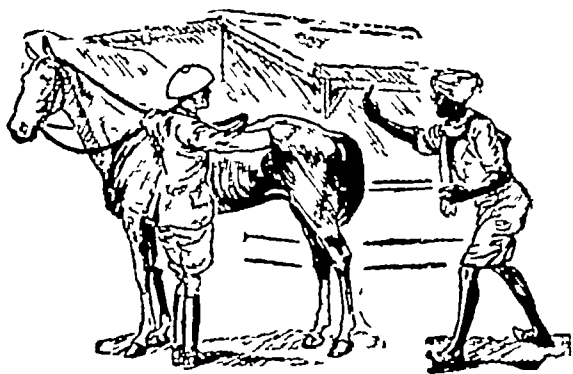
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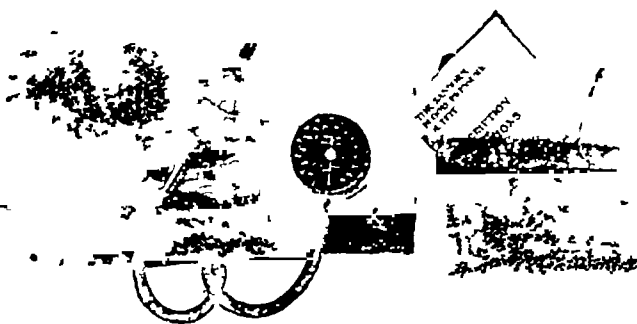
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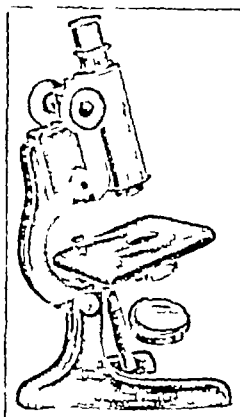
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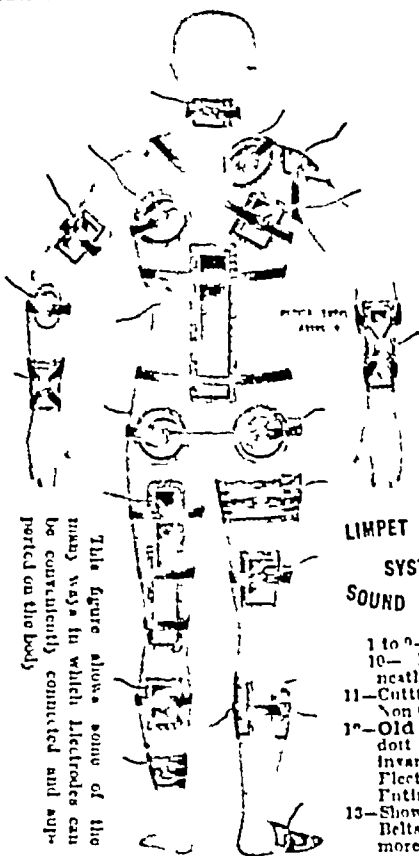
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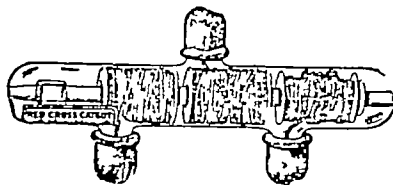
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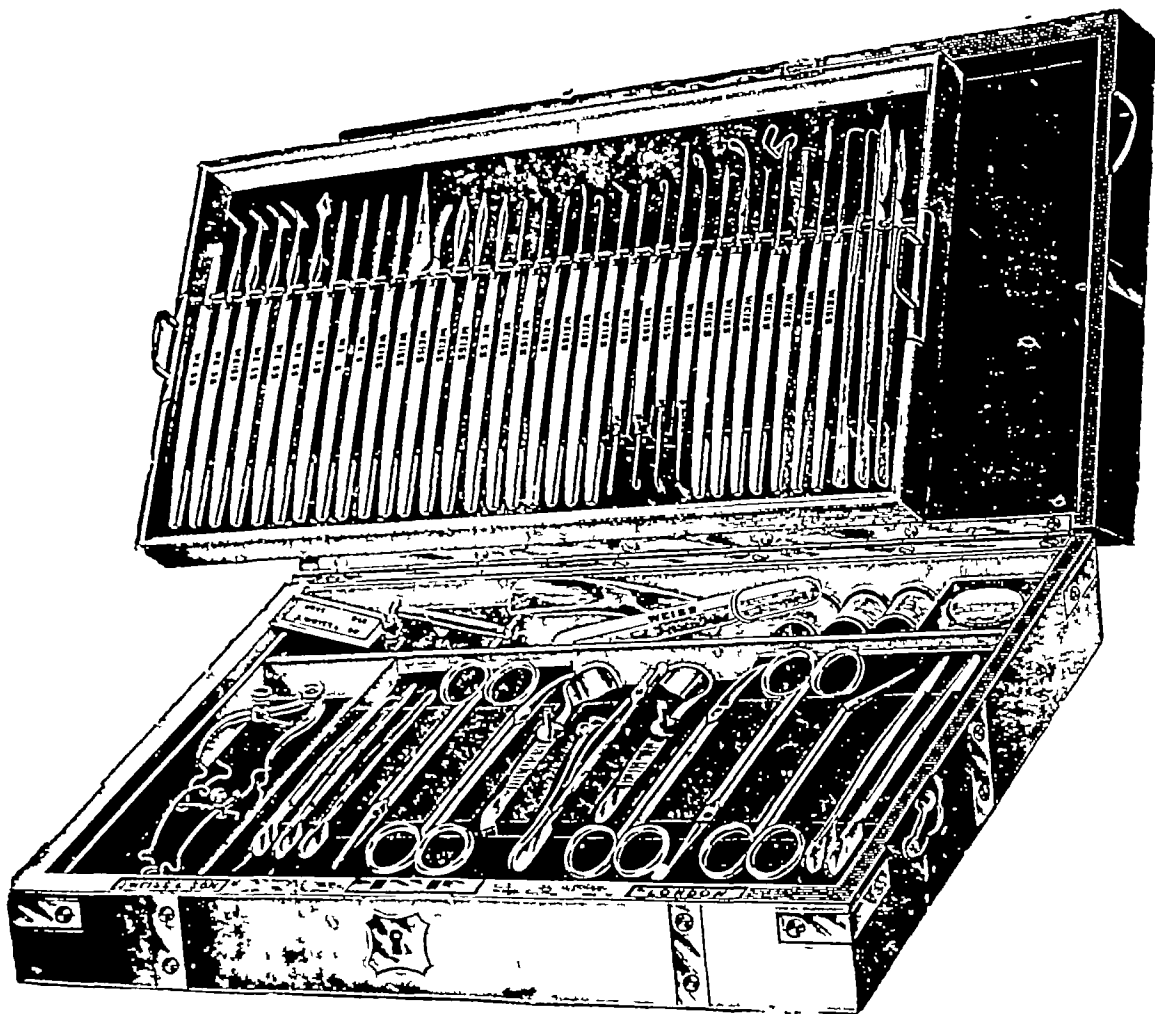
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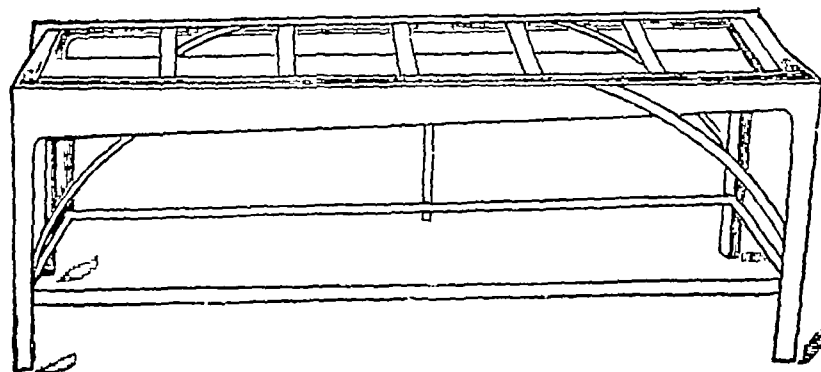
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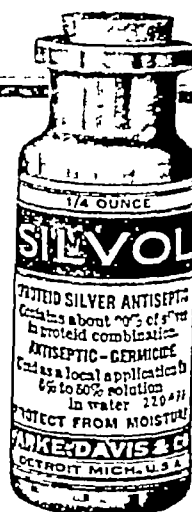
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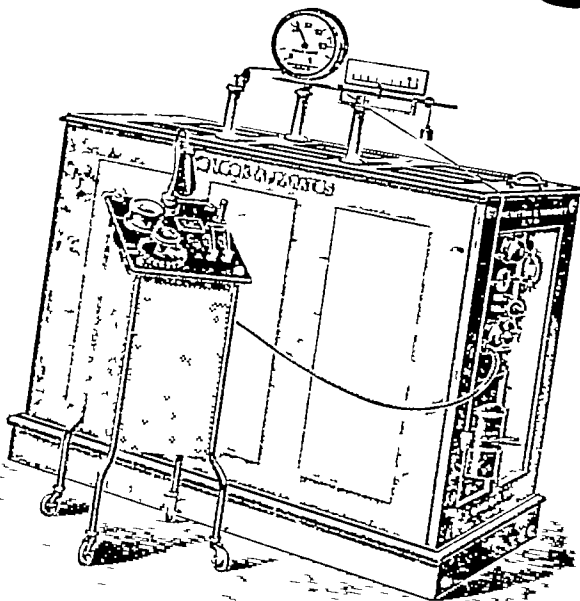
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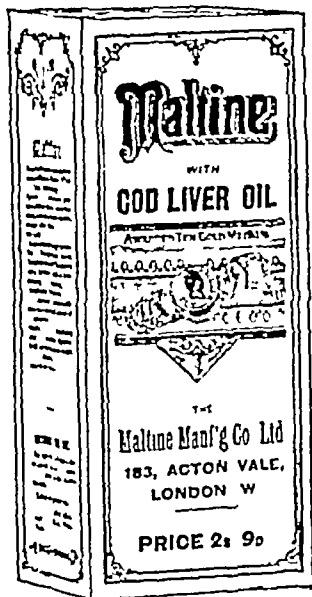


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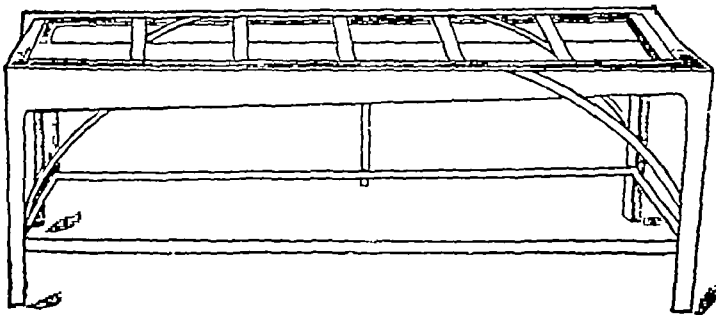
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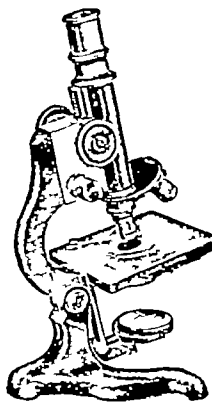
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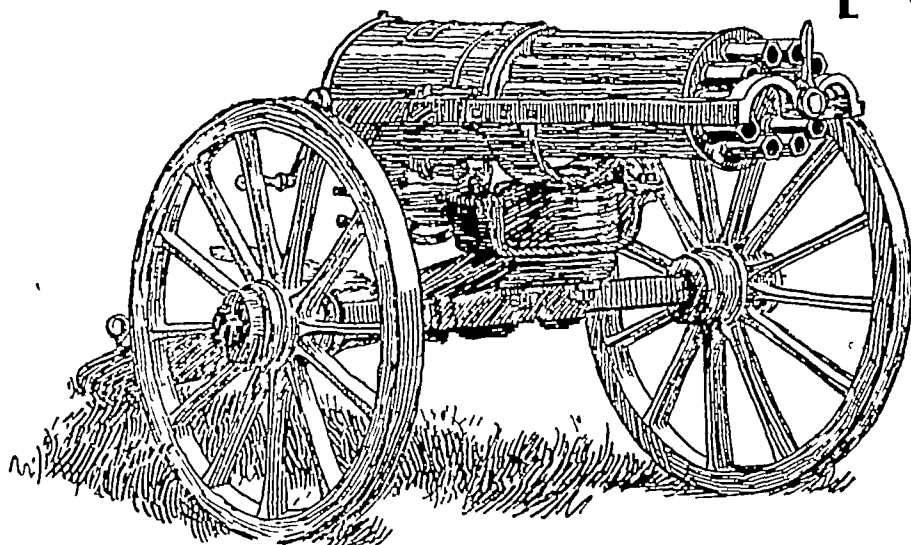
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In neurasthenia associated with high blood pressure and all hypertensive conditions use

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This preparation was mentioned very favourably by T. Bodley Scott, Esq. in *The Practitioner* for November, 1917. See page 481

Dose of either preparation: One or two tablets three times daily before meals.

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HORMONE THERAPY IN RUN-DOWN CONDITIONS

A hormone is a substance formed in any organ of the body which is carried by the blood stream to a more or less distant organ and arouses that organ to activity. This does not necessarily mean that the activity aroused is confined to that particular more or less distant organ itself, but rather that the activity is exerted for the good of the body as a whole. Thus, the thyroid secretion acts as a hormone on the ovary and the testis and the sexual glands in their turn help to define and maintain the secondary sex characteristics such as the distribution of hair, the pitch of the voice, etc. These secondary sex characteristics are thus in reality initiated in part, at least, by the thyroid secretion.

An illustration such as this enables one to realize that the inter-relationships of the glands of internal secretion are so many and so complex that it is often advisable to give the product of one gland for the effect it will have upon another gland, in other words, its hormone effect.

Again, it is often better to administer a variety of gland substances where there is every evidence that a patient is suffering from a general lowering of the tone of the body, due to a partial insufficiency of function of the glands that make up the chain that links together the dynamic forces of the body.

Pluriglandular therapy is reasonable from a theoretic standpoint and in practice it has given very desirable results.

"The practitioner should grasp the idea that morbid states may be consequent upon pluriglandular insufficiency and this will encourage him to substitute multiglandular for monoglandular organotherapy on the same lines and for the same reasons that we employ polyvalent sera." Dardel (*The Present Status of Organotherapy*, *The Practitioner*, July, 1912).

"With polyglandular therapy I have not had very much experience, but since I have been using the mixture called Hormotone I have had considerable success in those cases just referred to as benefited by pituitary." Leonard Williams (*Discussion on Therapeutic Value of Hormones*, *Proc Roy Soc Med*, London, Jan 20, 1914).

"Much evidence has accumulated showing that disease of the ductless glands is usually plural rather than isolated and single. Pluriglandular disease is rather the rule than the exception. The use of gland extracts in the treatment of aplasias of the pluriglandular system has become an established therapeutic measure of miraculous potency." Bayard Holmes (*The Internal Secretory Glands*, *Lancet-Clinic*, Sept 19, 1914).

Hormotone is a well thought out combination of the hormones of the thyroid, pituitary, ovary and testis and as such represents a distinct step in advance in pluriglandular therapy. Each tablet contains 1/10 of a grain of desiccated thyroid and 1/20 of a grain of desiccated entire pituitary.

The systematic administration of Hormotone opens up a new era in organotherapy, and here one is following Nature's methods, for it is to be remembered that the blood is a pluriglandular stream conveying the hormones to the particular tissues or organs for which they are destined and on which they will exercise their specific effect.

In neurasthenia of the true asthenic type Hormotone has been very efficacious. Naamé in his *Studies in Endocrinology*, attributes neurasthenia to glandular hypo function. He says that the asthenia is of suprarenal and testicular origin. The low blood pressure and the headache associated with arterial hypo function arise from a suprarenal and pituitary deficiency. The irritability of temperament seems to be due to hypoparathyroidism and the cerebral depression due to hypothyroidism. Pluriglandular therapy, Naamé says, wisely selected and associated, acts efficaciously on each and every neurasthenic symptom. To use his own words "I can speak authoritatively because I myself constitute a definite example of serious neurasthenia accompanied for ten years especially with insomnia and mucomembranous enteritis. I have used opotherapy and have made myself over from a glandular standpoint and am now in perfect health."

Physicians who use Hormotone in these run-down conditions will be surprised and delighted with the good results obtained. The dose is one or two tablets three times daily before meals.

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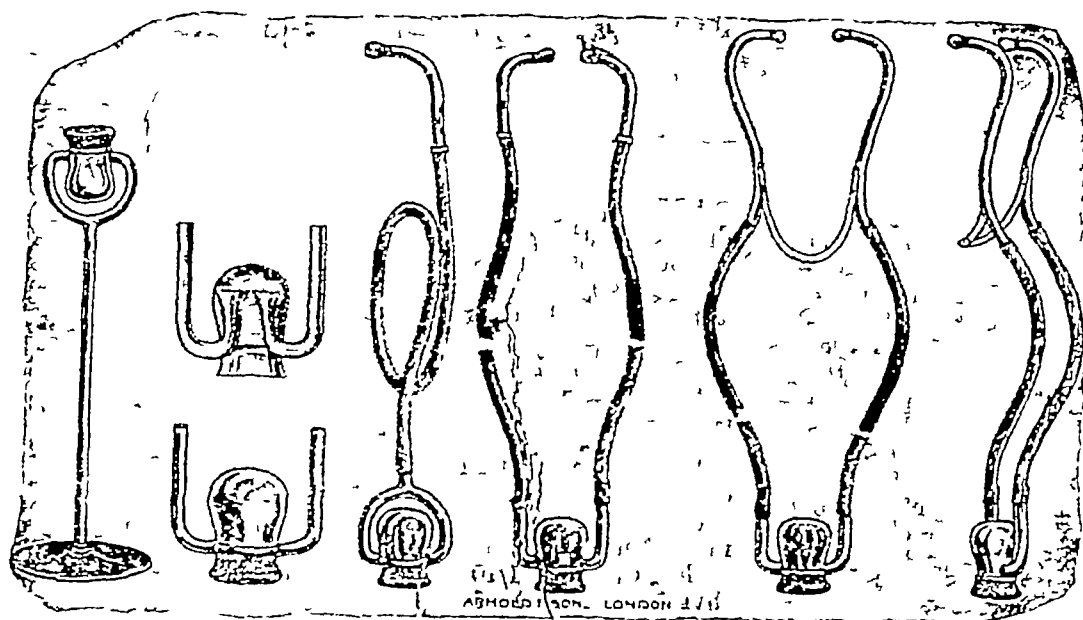
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Ditto Single flexible
(Fig C) 11/6
Ditto Double flexible
(Fig D) 15/6
Ditto Binaural " " (Fig E) 17/6
Ditto Folding " " (Fig F) 18/6

FIG A

FIG B

FIG C

FIG D

FIG E

FIG F.

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Medical Review, August, 1905



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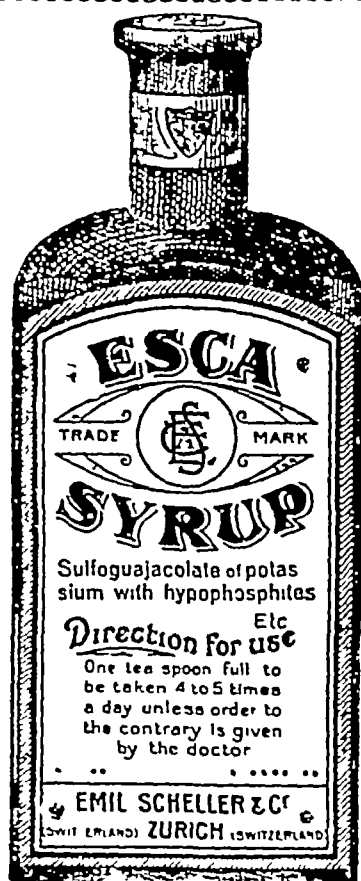
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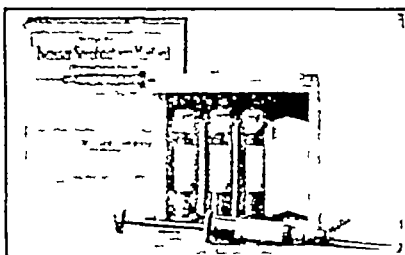
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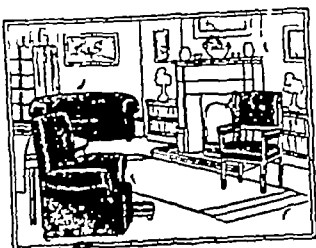
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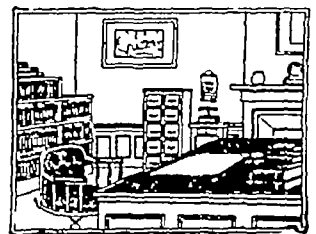
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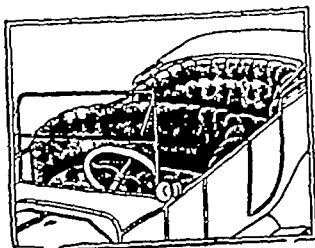
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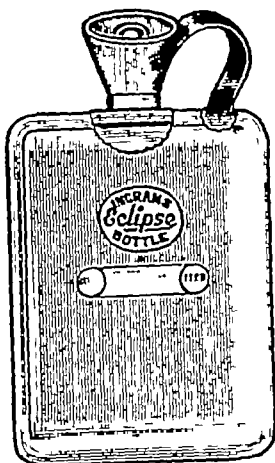
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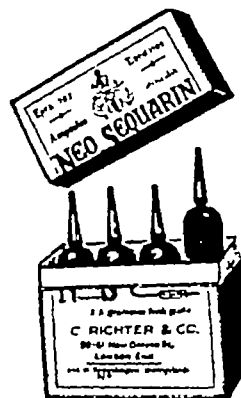
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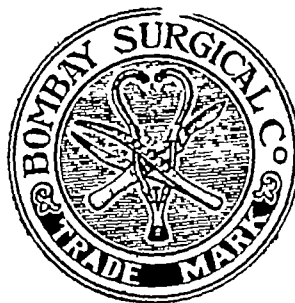
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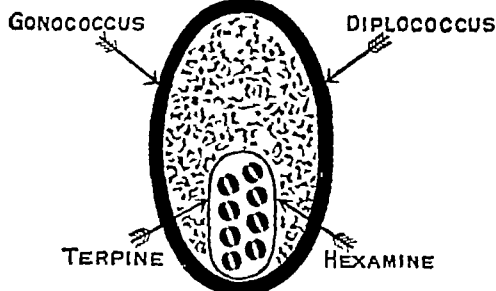
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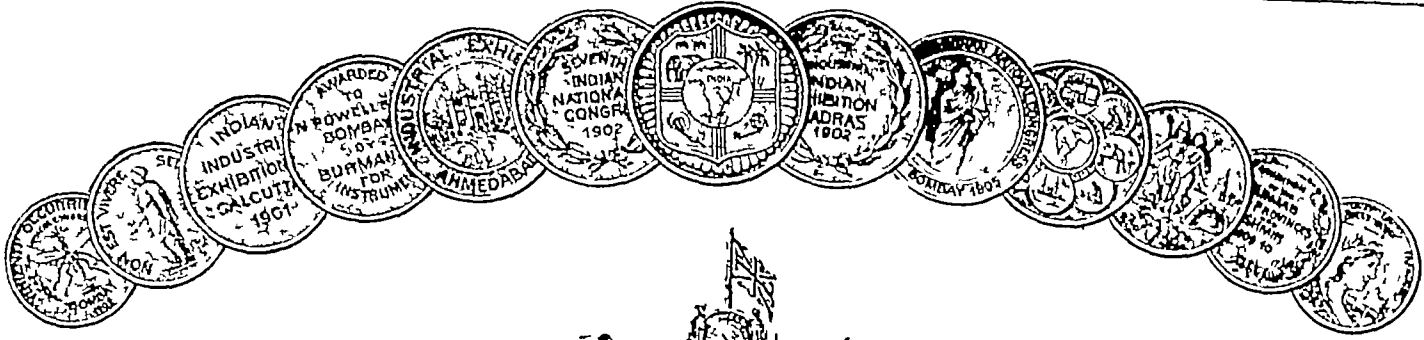
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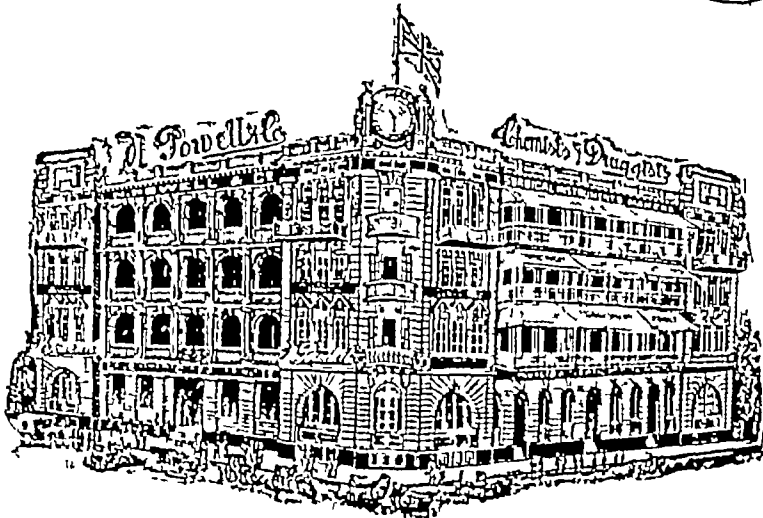
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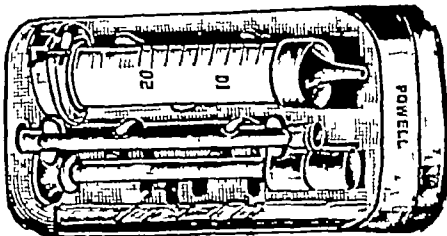
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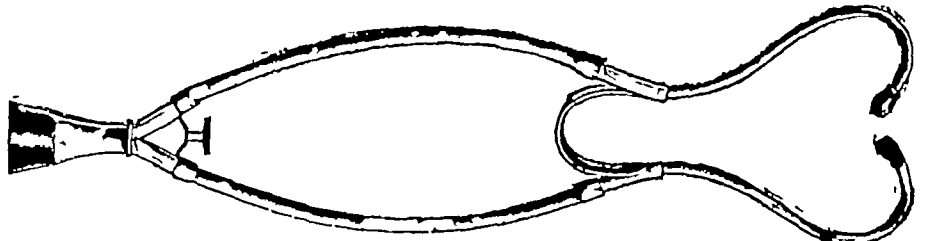
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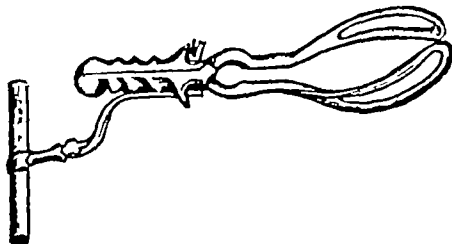


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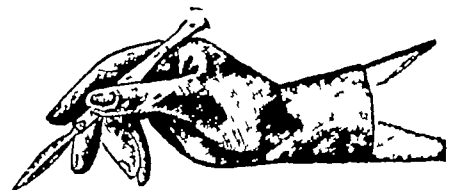
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Fig. 402, Eye Instrument Case No. 4

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To—Officer Commanding

T[11 August 25th, 1917

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To—Major , London

Personal

Remarks by the Supply Officer above in connection with the test made of Milton at the Supply Depot of this Station are forwarded please I might mention what I saw of one or two demonstrations made by Mr Smith, it could be used to a very great advantage for many purposes, both in the Supplies and the Transport Sections of the C. A. S. C. It is by far the best disinfectant I have as yet seen and in view of the fact that fresh meat issues are about to be made, the butcher's shop is going to be not very far short of a slaughter house, and as a disinfectant and fly exterminator for this particular purpose I would strongly recommend the purchase of Milton in this connection

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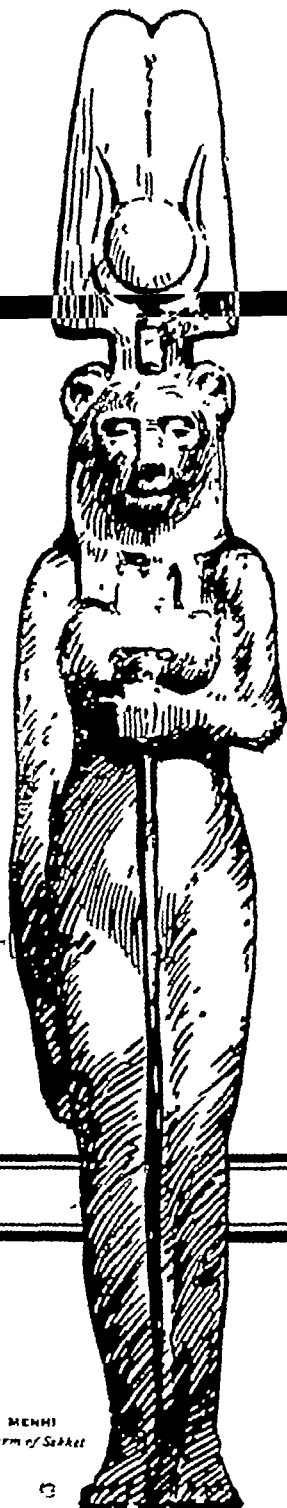
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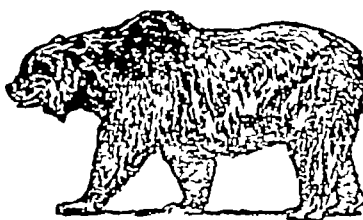


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Original Articles.

STANDARD DIETS

By J A SHORTEN,

MAJOR, I M S

(A lecture delivered at the Calcutta Health and Child Welfare Exhibition)

THE subject on which I have been requested to address you this evening is one the importance of which can scarcely be over-estimated. The question of the most suitable diet for human beings has engrossed scientists, and I might add cranks and quacks, throughout the ages. It will be obvious to all of you who live in India, or have travelled abroad, that human beings can live and flourish on many different types of diet and foodstuffs. The diet of the Hindu is not that of the Mohamedan, and the diet of the European is different from both. Yet all three flourish side by side in India. It is obvious, however, that there must be some common basis, for physiologically there is very little difference between individuals of different races. It is to this basis that I wish to direct your attention this evening.

The subject of a standard balanced diet has formed the ground for much controversy. Books and pamphlets on dietetics have been written and are being written *ad nauseam*. Those who believe in our ultimate descent from monkeys point to our dentition and say man was meant to be a vegetarian. Others, noting the superior development and predominance of the meat-eating races, hold that the development of the human race began when man became a hunter and, so to speak, tasted blood. Each view may be right in its own way, but the fact remains that man is an omnivorous animal and flourishes best as such. In seeking for a properly balanced diet we must start from this assumption. I do not propose, however, to discuss the various theories of cranks and faddists, but to confine myself to well-established facts,—facts which are capable of experimental proof.

Until a few years ago physiologists and physicians were satisfied that bed-rock had been reached in the matter of diets. Quite recently, however, new facts have come to light. The Great World War which brought misery to thousands has been the means of shedding light on many medical and hygienic problems. The question of an adequate and well-balanced diet is not the least of these. Among other things that the war taught us is the fact that most of us who are fairly well to do can live on much less than we usually eat, in fact, we should feel better and be better with less food. In England during the war many essential foodstuffs such as butter, meat, milk, and sugar were of necessity reduced to a minimum, and people generally did not seem to suffer in consequence.

The minimum, however, is not necessarily the optimum. We must remember that we are not delicately balanced mechanisms but living beings,—our powers of adjustment are almost unlimited. A speck of dust will stop the delicate movements of a watch, but it would take many specks of dust to stop beating of the human heart. The recent dismal mechanistic physiology, to quote Bayliss, is passing away and is being to some extent replaced by the ancient ideas of vital force.

To return to the elucidation of the problem before us let us ask ourselves what is the purpose of food. In this connection Professor Bayliss, the eminent physiologist, writes —

"The purpose of food is two-fold—on the one hand, to serve as material out of which the structures of the body are produced, and, on the other hand, to afford the energy required for muscular work by being burnt up and oxidised." Food, as it were, on the one hand, goes into the walls of the human edifice, and on the other hand into the fire on the human hearth. Food is used for constructive purposes chiefly in the young and growing animal. The amount required to replace ordinary wear and tear of the active tissues is very minute. So that the greater part of the food of adults is used to supply the human engine with fuel.

Theoretically any combustible substance that can be digested and absorbed may serve as a source of energy, but practically our choice is very limited. Petroleum, for instance, when burnt in an internal combustion engine is capable of yielding an enormous amount of energy, but it is perfectly useless as food.

There are three classes of chemical compounds available as foodstuffs, *viz.*, protein, fats, and carbohydrates. Examples of proteins are egg white, meat, etc., of fats, butter and suet, and of carbohydrates, sugar, starch, flour, etc. It is found that certain minimum quantities of each of these foodstuffs are necessary to maintain the body in an equilibrium of material and energy. But these are not sufficient for the maintenance of perfect health. We require in addition water and certain mineral salts, such as chlorides and phosphates of sodium and potassium.

These five substances, proteins, fats, carbohydrates, water, and salts, are usually referred to as the proximate principles of food. Until recently these five proximate principles were, with the oxygen we take in through our lungs, considered all-sufficient for the maintenance of life and perfect health. It is now recognised, however, that certain other substances, called accessory food factors, are necessary. The absence of these for any length of time will lead to one of the so-called deficiency diseases. Of these accessory food factors one is called *fat soluble "A,"*—a substance which is found in animal fats such as butter and suet, and also in certain of the leafy vegetables and grasses, but not in vegetable oils or fats such as go to make margarine. This substance is necessary

for the growth and development of young animals. Young rats, for instance, fail to grow and eventually die if fed on a diet from which this substance is eliminated. The importance of this discovery in considering the diet of infants and young children is self-evident. The second accessory food factor is called *water soluble "B"* since it is soluble in water. This substance is widely distributed in the vegetable kingdom, being found in abundance in the wheat-germ and yeast. It is also present in certain animal substances, such as yolk of egg. It appears to be necessary to prevent the development of beri-beri. Fat soluble "A" has recently been shown by Mellanby to be identical with a substance which prevents rickets. In addition to these two groups of substances there is a third which prevents scurvy. According to our present knowledge, then, the substances which go to make up an adequate diet are —

- 1 Proteins
- 2 Fats
- 3 Carbohydrates
- 4 Water
- 5 Salts
- 6 Accessory food factors, of which we know three — Fat soluble "A," water soluble "B," and the antiscorbutic factor

The characters of a suitable and healthy diet may be summed up as follows —

- (1) It must contain the proper amount and proportions of the various proximate principles
- (2) It must be adapted to the age and weight of the individual, the amount of work he performs, and the climate
- (3) The proximate principles must be present in a digestible form. For instance, peas and beans contain a large percentage of protein, but, in an indigestible form, and, therefore, are not as good a source of protein as meat

In order to arrive at a standard diet physiologists in the past have been at pains to strike a balance between the amount of nutriment ingested and the amount excreted in various ways. The two most important chemical substances concerned are carbon and nitrogen. It has been found that a healthy man eliminates 250–280 grms of carbon and 15–18 grms of nitrogen daily. These must be replaced by carbon and nitrogen in the food. Now, chemistry tells us that the main source of carbon is the carbohydrates, and that of nitrogen the proteins. Hence the great importance of these two foodstuffs or proximate principles.

The value of diets is usually expressed in terms of their heat-value, that is, the amount of energy they can liberate as heat on complete oxidation. The unit of heat-value is the caloric, or the amount of heat required to raise the temperature of one kilogram of water by one degree centigrade.

It will be clear to all of you that the necessary amount of food will vary in proportion to the amount of work done. But even when we

are asleep energy is being used by the heart and other vital organs, and also to keep up the body temperature. This "basal metabolism," as it is called, has been calculated at 1,700 calories per day, for a man of 11 stones. If we then add on to this the amount required for various types of work we arrive at a basis for a standard diet. For instance, a tailor, doing light work, would require about 2,500 calories per diem, a metal worker 3,800, and a wood sawyer 5,500.

To give a concrete meaning to these figures Professor Bayliss gives the amounts of various foodstuffs required to furnish 100 calories roughly as follows —

Butter	$\frac{1}{2}$ oz (13.5 gms)
Cheddar cheese	$\frac{3}{4}$ oz (22 gms)
Sugar	$\frac{3}{4}$ oz (24.5 gms)
Oatmeal	1 oz (28 gms)
Mutton	1 oz (29 gms)
Fish	$2\frac{1}{2}$ oz (67 gms)
Eggs	$2\frac{1}{2}$ oz (68 gms)
Milk	5 oz (145 gms)

From figures such as these we can readily calculate the amount of different foodstuffs we require. We must, of course, always allow for food which may not be digested and utilised. An addition of 10 per cent is usually considered to be sufficient to cover this loss.

Working on the above lines various physiologists have arrived at certain standard diets, one of the best known of these classical diets is that of Ranke. It consists of —

Protein	100 gms
Fat	100 gms
Carbohydrates	250 gms

This diet has a heat-value of about 2,500 calories. Voit and others give more liberal diets.

The diet recommended by a Committee of the Royal Society, appointed during the late war to work out a diet for the nation, was as follows —

Protein	70 gms	280 calories
Fat	90 gms	810 calories
Carbohydrate	550 gms	2,200 calories
Total		3,290 calories

This diet is considered suitable for a man of 11 stones doing moderate work. It will be noted that it is somewhat poorer in protein and richer in carbohydrate than the classical diet mentioned above. Tables have been drawn up from which the total calorie value of a given diet can be calculated. Moreover, as Professor Bayliss points out, most of the complex articles of diet such as bread, potatoes, etc., contain a sufficient proportion of protein, — a fact which he has expressed in the aphorism, *Take care of the calories and the protein will take care of itself*.

We may now turn for a few moments to the different proximate principles and consider their use individually and their history in the metabolism of the body.

Proteins—As already pointed out, we require nitrogen to replace that eliminated in the excretions, and to build up the structural machinery of the body. This nitrogen we take in the form of protein. Now, protein is absorbed with difficulty from the intestinal canal. Hence the necessity for digestion. Protein is broken up into simpler substances by the digestive juices and is finally absorbed in the form of amino-acids. Part of the absorbed amino-acids are converted by the liver into urea, which is eventually excreted, and the rest pass on to be built into the tissues. Only a small moiety of the protein absorbed goes to supply energy. The amount of protein required is relatively small, as it depends on the amount of tissue waste to be repaired, and is not important as an energy-yielding food. The Royal Society Commission recommended a ration of 70 gms daily—part of which should come from animal sources. The majority of the classical standard diets include 100 gms or over.

High protein diets are condemned by various writers. Chittenden, for instance, as a result of experiments on students, soldiers and athletes, came to the conclusion that 30 to 50 gms of protein daily, according to the weight of the individual, is all that is needed. The period of observation, however, lasted only a few months, and it is clear now that he was deceived by some of the subjects of his experiments.

McCay calculated that the average Bengali metabolises only 37.5 gms of protein,—a figure which closely approximates those of Chittenden,—and maintains health thereon. But on the other hand he draws attention to the marked physical inferiority of the Bengali when compared with meat-eating races living under similar conditions, and the great prevalence of renal diseases amongst them.

Our instinctive appetites lead us when possible to adopt a diet with a high protein content, and it would seem to be only reasonable to encourage a certain margin of safety. The Roast Beef of Old England is a phrase which may have more in it than meets the eye, as the Boche found to his cost.

Before leaving the subject of proteins a reference must be made to the so-called purin-free diets, the advocates of which claim so much. The best known of the purin bodies is uric acid, a substance which is probably the most maligned of all chemical compounds. Half the ills to which human flesh is heir are attributed to it. Purin bodies form components of the nuclei of the cells of the body, and are normally excreted in small amounts. Excess of uric acid is undoubtedly associated with gout, but there is no proof apart from this that the group possesses any particular toxic properties. It is interesting to note that caffeine, the chief alkaloid of coffee and tea, and theobromine, the active principle of cocoa, are closely related to the purin bodies. You will

be pleased to know, however, that the balance of scientific opinion is against advocates of this fantastic diet, and you may continue to enjoy your tea, coffee and cocoa without fear of the dire evils which they say will befall you.

Carbohydrates—These can be dismissed in a few words. They form the chief source of our supply of energy. Since they contain no nitrogen they have little to do with tissue growth or repair. The chief carbohydrates taken as food are starch, cane-sugar, milk-sugar, maltose and glucose (in fruit, etc.). They must all be converted into glucose, or some simple sugar of the same group, before absorption. This change is chiefly brought about by the saliva. Hence the importance of properly chewing starchy foods. After absorption they are partly stored in the liver as glycogen, and the rest is passed on to the tissues, especially the muscles, where it forms the main source of the energy required for muscular contraction. Carbohydrates, therefore, are of great importance to those who undergo prolonged or severe muscular exercise, such as is involved in mountain climbing and marching. On the other hand, excess of carbohydrates, such as sweetmeats, is liable, in the indolent, to lead to failure of the mechanism for digesting and utilising them, and eventually to diabetes, as has been shown by McCay and his collaborators.

Fats—As already mentioned, both proteins and carbohydrates are absolutely necessary constituents of our food on account of the necessity of replacing the nitrogen and carbon lost in the excreta. The same cannot be said of fats, except in so far as they serve as a vehicle for the fat soluble vitamins. Fat is formed from carbohydrate in the body. In fact, the excess of carbohydrate ingested is up to a certain limit laid down in the body as fat. The digestive juices split fat into fatty acids and glycerine, which are recombined as they pass into the lymphatics, so that the absorbed fat eventually appears in the blood in the form of fine droplets.

Fat is a very concentrated form of energy-giving food, yielding 9 calories per gram as compared with 4 calories per gram each in the case of proteins and carbohydrates. The Royal Society recommended that 28 per cent of the total calories of a diet should be in the form of fat.

Salts—No special provision need be made for salts. They are present in many of the usual articles of diet, such as fruits, vegetables, and salads.

Water—The necessary supply of water is regulated by the feeling of thirst. Neither water nor salts afford energy, but, as Bayliss expresses it, they are necessary in the same sense as lubricating oil is to a motor.

Accessory food-factors—The fat soluble "A" factor is necessary to ensure growth—particularly in children and in adults recovering from wasting diseases. It is, therefore, important

that growing children should have a plentiful supply of fresh milk, butter and eggs. In the absence of these, codliver oil may be given as a substitute or as a medicine.

As regards the water soluble "B" factor, this, as already mentioned, is widely distributed in the common articles of diet. Danger arises, however, from a one-sided diet, as when polished rice or white bread forms the staple diet. This vitamine is concentrated in the outer layers of the grain, and this is the part removed by the process of milling. The seed-germ, too, which contains a large proportion of the vitamine, is removed by the same process. The importance of unpolished rice and whole meal bread to a community living mainly on these foodstuffs cannot, therefore, be over-estimated.

The anti-scorbutic factor—This is a recent discovery, although scurvy is one of the oldest of the recognised human diseases. It has long been recognised that fresh fruit and vegetables are necessary to prevent the appearance of this disease among bodies of men such as sailors and troops. The classical Treatise on Scurvy, by James Lind, published 150 years ago, gives an excellent account of this disease and the use of fresh vegetables and fruit in its prevention.

The recent researches of Harriet Chick and Margaret Hume have added greatly to our knowledge of anti-scorbutic vitamins. Working with guinea-pigs, which readily develop scurvy on a basal diet of grain and water, these authors investigated the preventive effects of the addition to the basal diet of (1) fresh and dried vegetables, (2) fresh fruit juices, pulses soaked and germinated, (3) milk, (4) meat.

Their results and those of various American investigators go to show —

(1) The protective power of small quantities of fresh vegetables.

(2) Vegetables dried at high temperatures have no anti-scorbutic properties, but if dried at low temperatures they retain an appreciable amount of this virtue.

In this connexion, in conjunction with Dr Charubrata Ray, I have recently been able to demonstrate that certain of the sun-dried vegetables from Quetta, which correspond to the "low-dried" factory product, also retain considerable anti-scorbutic powers, those specially active being sun-dried tomatoes, potatoes and cabbage.

(3) Fresh lime juice protects, but stale or artificial products are useless.

(4) Fresh milk has considerable power, but if subjected to prolonged boiling or heated to 120 degrees C, it loses its power of protection.

(5) Fresh meat has some preventive properties, but they are not so marked as in vegetables, etc.

Among other facts demonstrated by various research workers is the fact that ordinary boiling of vegetables does not diminish to any great extent their anti-scorbutic properties, but if

the boiling is prolonged, or if alkalies such as bicarbonate of soda are added to the water, the vitamine is quickly destroyed. Prolonged cooking such as that involved in the hay-box method of cooking, in vogue during the war, is thus unsuitable for any substances of anti-scorbutic value (fruit and vegetables).

It also follows that tinned rations, vegetable or otherwise, which have been raised to 120 degrees C in the process of manufacture, are devoid of anti-scorbutic properties.

One of the most important discoveries made by Chick and Hume is that although dried pulses have no anti-scorbutic properties, if moistened and allowed to germinate, the anti-scorbutic elements re-appear in 48 hours, and that such freshly germinated material may be cooked for from 1 to 1½ hours without destroying the anti-scorbutic vitamins.

In conclusion you will naturally ask—How can the layman apply all these principles in daily practice? A few simple diet rules will best answer this question. These are —

1 Avoid a one-sided diet, remembering that you require proteins, fats, carbohydrates, and accessory food factors.

2 As good digestion is said to follow appetite, have your food cooked to satisfy your tastes and desires.

3 In the case of children, remember the importance of fat soluble "A" and give fresh milk, butter and eggs. Fresh orange or lime juice should also be given daily to prevent the possible development of scurvy.

The question of fresh milk is a difficult one on account of the danger of infection by enteric germs, cholera, etc. But if you can't keep your own cows it will be possible for many to keep goats which can be milked under your personal supervision. If you can't do either, remember the value of codliver oil.

4 Remember the value of whole meal flour and unpolished rice when flour and rice form the main articles of your dietary.

5 Remember the anti-scorbutic value of fresh vegetables and fruits. As regards the danger of cholera or typhoid, fruits the skin of which can be removed, such as oranges and plantains, are always safe. Fresh vegetables such as salads can be made safe by simply scalding in boiling water or using some simple disinfectant such as Condy's fluid.

6 Lastly, do not boil your vegetables for too long a time and, above all, do not add soda to soften them.

These few simple rules sum up all the most recent knowledge on the subject of diets.

TYPHUS AND TYPHUS-LIKE FEVERS IN BIRJAND, EAST PERSIA

By A S FRY,

CAPTAIN, I M S

TYPHUS FEVER has been met with frequently by the Medical Services in the northern part

of East Persia, both amongst the inhabitants and amongst our own troops. The Russians in Transcaspia have suffered heavily from the epidemic disease.

The following notes were gathered from nine cases of typhus or typhus-like fever which were met with in Birjand during 18 months of hospital experience amongst the garrison of troops stationed there. Six of these cases were admitted to hospital during May and the last few days of April, 1919. One case occurred in the middle of June, and the other two during the first three days of July, 1919.

Case 1—The first admission was a young Indian clerk of the Works Department, on April 24th, complaining of fever since the previous day, severe headache and backache. There were no physical signs to note other than a furred tongue. The blood was negative for malarial parasites and for spirilla. The following evening the blood was again examined without result. On the fourth day of the disease the tongue was very red and fissured. The throat was congested and the uvula oedematous. There were no head symptoms or signs. On the fifth day the patient declared that he felt better, and the pain in the head and back was less. A few red spots, which faded on pressure, were observed over both arms and on the trunk. The patient was promptly isolated under suspicion of suffering from fever of the enteric group. On the sixth day the rash was well developed, especially over the back of the trunk and on the flexor aspects of the limbs. There was tenderness on palpation over the right costal margin, but no enlargement of the liver or spleen. On the seventh day the rash was fully developed all over the body, including a few spots on the face. Headache persisted, he did not complain of backache. The spots were pin-coloured, perceptible to the finger, and faded on pressure. They varied in size from typhoid-like spots to circular macules $\frac{1}{4}$ in in diameter. On the ninth day signs of congestion were present at the bases of the lungs. On the tenth day the rash began to fade. The patient was listless and drowsy, and the pulmonary congestion gave rise to anxiety.

On the thirteenth day the patient passed his motions involuntarily in bed. On the sixteenth day the motions contained blood and mucus. The general condition was slightly better, as the incontinence of faeces did not continue. A starch, bismuth and opium enema was administered. The stool was subjected to microscopical examination, but no amoebæ were found. On the seventeenth day the rash had almost entirely faded, leaving a few brownish stains which disappeared in the course of the next ten days. No petechiæ were present. On the eighteenth day eight doses of magnesium sulphate were given—drachms two every two hours. This had no effect on the colitis. On the twenty-first day emetine hydrochloride gr $\frac{1}{2}$ was given hypodermically morning and evening,

and repeated daily twice until twenty such doses had been given. On the twenty-second day the lungs were normal. The tongue was moist and covered with flakes of sticky, white coating. The stools daily consisted mostly of blood and mucus. On the twenty-eighth day a small, punched-out bed sore formed over the sacrum. The tongue was clean. The colitis continued. On the twenty-ninth day he passed the first stool without blood or mucus since the onset of the colitis, but in the evening the stool contained a little blood. The next day the stools were free from blood and mucus, and of watery consistence. On the thirty-sixth day the motions became soft, semi-formed, yellow in colour, but still rather frequent. On the forty-second day the stools became finally normal in frequency and consistence.

The bedsores healed slowly during the course of the next month. The patient, who had been much reduced by the illness, slowly regained his strength and weight. No bands of conjunctival congestion were noted as have been described in typhus fever, but there was a certain degree of bulbar congestion under cover of the lids. Towards the end of the fever and during the first few days of convalescence the patient displayed a weakness in protruding the tongue, which was tremulous, and inability to protrude that organ fully. On 19th July he was discharged from Hospital, fit and well-nourished. He was ordered a fortnight's rest before he resumed his clerical duties. Eighteen days later he died after an operation at which a gangrenous appendix and retro-cæcal abscess were found. It is interesting that a blood-count performed before the operation showed a polymorph percentage of only 70.5 which leads one to speculate as to the possible connection of this late complication with the early dysenteric lesions.

Cases 2, 3, and 4—On April 27th, a private follower of certain clerks of the Audit Department was admitted to hospital with fever. Three days later one of his masters was admitted with the same complaint, and on May 4th his other master, who was the father of the young lad whose case has been described, also succumbed.

All four men were fair-skinned. In all four cases the rash was similar, profuse, well marked and never petechial. The spots were most numerous on the trunk and upper arms, the face, if affected, showed only a few spots. A few spots appeared on the fifth or sixth day of the fever, the rash was fully developed on the third or fourth day of its appearance and then faded gradually until about seven to ten days later brownish stains were left which slowly disappeared without any marked desquamation. The watercourse appearance was not observed except in one case where there was a very faint mottling of the skin of the back on the day of the appearance of the rash.

In other respects these three cases resembled clinically that already described, except that bedsores and colitis complications were absent. The prostration was not so marked, nor was the tongue sign present except during the last two days of the fatal case. The patient might feel out of sorts for one day before the fever became evident to him. The general symptoms of fever were present—febrile aches and pains, headache—not so marked as in relapsing fever—and backache. Pulmonary congestion, as evidenced by crepitations and rhonchi heard over the bases of the lungs, appeared in each case from the third to the sixth day after the appearance of the rash, clearing up in about a fortnight in the three cases which recovered. The liver edge was noted as tender in the first case described, and the organ was slightly enlarged during the height of the fever in another case which recovered. No splenic changes were noted. In each case there was some degree of looseness of the bowels both during the fever and also during the first week or two of convalescence.

The two clerks made a rapid and complete convalescence. The private follower died. He was a well-nourished man admitted on the second day of fever. The rash developed on the sixth day. The next day he had slight epistaxis from the right nostril. On the ninth day the rash was fully developed and very profuse, being the most marked of the four, although the face was not affected. A brownish tinge was noted on the white-coated tongue. Pulmonary congestion developed on this day. On the thirteenth day he was doing excellently well and gave cause for no anxiety. Morphia hypodermics had been given for sleeplessness, and the effect, carefully noted, gave no contra-indication to its use. On the fourteenth day, however, the patient was found to be apathetic, and was induced to take his nourishment with some difficulty. The pulse was good, there was no delirium, but the tongue was rather dry and crusted. On the morning of the fifteenth day he suddenly collapsed, and his sunken eyes and pinched features presented a remarkable change from his appearance on the previous day. Towards noon he passed into a condition of unconsciousness and died at 2-35 P.M.

The blood was examined in all cases several times and no spirilla or malarial parasites were found.

Case 5—The fifth case I submit as an example of mild, abortive typhus. The patient was a clerk from the same office as the other two audit clerks. He was admitted to hospital on May 9th, on the second day of fever. The blood was examined on the morning and evening of this day; no malarial parasites or spirilla were found. The patient was well nourished and had no symptoms at all throughout the fever except anorexia which persisted during the first three days of convalescence. The

spleen did not enlarge. On the fourth day a general blushing of the skin over the body and limbs was noted, and two pink spots were observed on the left upper arm. A few crepitations were audible over the base of the left lung. The next day the spots and erythema had disappeared and the lungs were clear. This patient was also fair-skinned. He made a rapid and complete convalescence.

Case 6—My next two cases were dark-skinned natives of South India. My private bearer was admitted to hospital on May 30th, on the third day of fever. The blood was examined on the third, fourth and ninth days without result. The fever commenced with a rigor and vomiting. On admission he complained of frontal headache, pain in the epigastrium and vomiting. The tongue was moist and coated with a brownish fur. The patient rapidly became extremely prostrated with a dry, brown, crusted tongue on the ninth day, which he was unable to protrude beyond the lips. The spleen was enlarged slightly but not palpable. No rash was observed and no lung signs, but the latter were not sought for too eagerly owing to the dangerous condition of the patient. After the first week of convalescence he emerged from his critical state and commenced to improve steadily. He made a complete recovery. This man had been inoculated with two doses of T. A. B. vaccine twelve months previously.

Case 7—The other patient was a sepoy from the station garrison admitted on June 17th, on the third day of fever. The blood was examined four times without result. No rash was seen. Rapid prostration was marked. The tongue quickly became dry, and when the patient tried to protrude it, the tip caught on the lower incisors and the tongue was not protruded beyond the lips. This sign was well marked on the twelfth day and persisted up to the eighteenth day, when the tongue became moist and thickly coated with yellowish fur. There was diarrhoea during the early part of the illness and also during the secondary fever, the stools being of pea-soup colour and consistency. Pulmonary congestion appeared on the sixth day and on the eighth day the lungs were full of rhonchi and bubbling râles. From the ninth to the eleventh day the pulse was dicrotic, thereafter the blood pressure improved. On the twentieth day the patient, although very debilitated, appeared to be mending. The lungs were clear, the moist tongue, still thickly coated, with clean tip and edges, could be well protruded. The next day, however, a secondary fever supervened. On the twenty-fifth day the fur on the tongue assumed a brownish tinge. There was tenderness in both hypochondriac regions, but neither spleen nor liver was palpable. The blood showed leucopenia.

On the twenty-seventh day the heart assumed a fetal rhythm. The base of the right lung was dull on percussion, and the breath sounds diminished, there were no accompaniments

The patient gradually sank from exhaustion, the fetal heart rhythm persisting. Three days before death a few fine crepitations were audible over the bases of the lungs, so that this secondary fever probably denoted a low form of pulmonary inflammation which resulted in death about noon on the thirty-fourth day.

Cases 8 and 9—The last two cases were two Persians from the Seistan Levy Corps, admitted on the first and third days of July respectively. They had white skins, but their rashes were not nearly so marked as in the first four cases. Both were well-nourished men and did not appear to suffer much from the effects of the illness, as both were clamouring for release from hospital within a week of the subsidence of the fever. The symptoms consisted of febrile aches and pains and mild frontal headache. The blood, examined several times, was negative for malarial parasites and spirilla. Only one showed inability to protrude the tongue, this sign occurring from the ninth to the eleventh day. Both had well-marked enlargement of the spleen during the fever, and one had slight enlargement of the liver. Signs of pulmonary congestion, absent in one case, were present in the other on the sixth day, when slight hæmoptysis occurred. The rash appeared on the fifth day in one and on the eighth day in the other. In both it consisted of a mottled erythema and pink erythematous spots over the trunk and upper arms, appearing together. The spots, which did not become petechial, commenced to fade on the second to third day after appearance, and the mottling was the last element to vanish on the fifth to seventh day of the rash, leaving no desquamation or pigmentation.

Case 10—I had one more case, which was returned as fever of the enteric group, but to my mind resembled much more the fevers I have described. This was a sepoy of the Station Garrison admitted to hospital on August 5th, on the second day of fever. He was dark-skinned and no rash was observed. On admission he complained of slight headache, severe backache and pain over the front of the chest. The tongue was rather dry and lightly coated. The spleen was enlarged, but not palpable owing to the rigidity of the abdominal muscles. There was tenderness on palpation in the right hypochondrium. Signs of pulmonary congestion were present, there was diarrhoea with "pea-soup" stools. Blood examinations were negative. On the seventh day the spleen was palpable at the costal margin and did not enlarge further. On the ninth day the patient presented the prostrated condition of typhus, the tongue was dry and covered with innumerable cracks, its margin was red and raw, it could not be protruded beyond the lips owing to the tip catching on the lower incisors. There was no delirium, but the patient was very weak and had wasted considerably. The motions were watery, brown-coloured, and contained flakes of mucus tinged

with blood. The pulse was small and not dicrotic. The spleen was palpable at the costal margin, and liver edge palpable and tender. There was no jaundice and no distension of the abdomen. On the fourteenth day the diarrhoea ceased and the patient felt much better. There was still some lung congestion.

On the fifteenth day the spleen had receded under the costal margin and the liver edge was not palpable, although there was still tenderness on palpation in the right hypochondrium. A small, hard, tender swelling was noticed in relation to the under surface of the left lower jaw near the angle. This increased in size towards the middle line. A carious lower molar was extracted from the left side on the sixteenth day, but no pus was obtained. On the twenty-first day the abscess burst into the mouth, *via* the socket of the extracted tooth, and about 2 oz of foul, greenish-yellow pus was expectorated. By this time the lungs were clear, but the tenderness over the right costal margin remained. On the twenty-third day the wound in the neck commenced to discharge greenish-yellow pus, gradually a large slough separated. The wound cleaned and granulated, the patient put on weight and convalesced slowly. During the first four days of October he had a recurrence of diarrhoea, the motions containing large masses of mucus without blood. This responded immediately to a course of mag. sulph. The septic complication was, I consider, due to periostitis of the lower jaw. When the patient was transferred down the line towards the end of October he was fairly fit, the liver and spleen were normal.

Among these ten cases there were two deaths. The case of mild typhus was fit for duty after three weeks in hospital. The first admitted case was three months in hospital. The remainder, with the exception of the last case described, were fit for duty within two months of onset. My bearer has been in the best of health since his illness, and distinguishes himself on the football field by his zeal and agility. The clerks are fine specimens of their class and would do credit, in appearance at any rate, to any office.

In the fever charts I think that I could trace some similarity. The febrile course may be divided into two parts: the first part consisting of a more or less continued pyrexia, the second part of a lower, irregular fever tending to remittent or intermittent type, the two parts being separated by a break of pseudo-crisis or pseudo-lysis. Cases 1, 4, 6, 7, 8 and 9 show this feature most distinctly, the break occurring from the 8th to the 11th day. In cases 8 and 9 the second part of the fever is partially suppressed, which was in keeping with the mildness of the cases and the ill-marked rash as compared with the first four cases. Cases 2 and 3 do not show these features. Case 5, which appears to be an abortive form of this fever, shows a break on the eighth day with complete suppression of the terminal

fever In case 10 the terminal fever merges into the fever of the septic complication

ON AN OUTBREAK OF RELAPSING FEVER IN TURKEY IN 1918

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TEL HADI

THE northern part of Mesopotamia, that is to say the country which lies between the rivers Tigris and Euphrates, consists for the most part of a very slightly undulating plain, crossed at long intervals by ranges of mountains—pimpled with extraordinary regularity by small roughly conical hills, some 100–200 feet high, called 'Tels'. This plain is watered by occasional streams and for two or three months in the spring is covered with a green herbage, which the advent of the hot weather about May changes to a brown dust. Towards the west this plain is populated by settled inhabitants who live in numerous villages, but to the east is uncultivated and inhabited only by wandering Bedouin tribes.

In this eastern part is a 'Tel' called by the Bedouins who used to camp about there in the spring of each year 'Tel Hadi,' and this was the spot chosen for the headquarters of one of the sections of the Baghdad Railway construction, when it was decided, during the war, to continue building this railway from Nisibin to Mosul. The Baghdad Railway was being constructed before the war by a German engineering firm, and this construction was continued during the war, for the Turkish government, by German engineers, mostly working with prisoner-of-war labour. Construction was commenced simultaneously at various points along the route, and the whole of the line under construction was divided for administrative purposes into sections. Construction in the Tel Hadi section was begun at the end of 1917, the rail-head then being at 'Tel Helif,' three days' journey to the west.

In April 1918, when the outbreak of relapsing fever began, the section consisted of a permanent headquarters and various camps of workers which changed their position as the work progressed. The workers mostly lived in tents, and those generally black Bedouin ones. The German engineers, and a few of the more important employees, had houses of stone and mud. There should have been a German doctor in medical charge of the section, but the one who was sent was killed in an attack made by the local Bedouins and never replaced, and in consequence from February onwards I had the medical arrangements in my hands.

The hospital was accommodated in two wooden 'baragues' and some stone houses and

tents. The arrangements were very makeshift and primitive, but we were lucky in having a good Leitz microscope and some stains.

Our cases were drawn from this comparatively isolated community of about 800 persons, of at least fifteen nationalities and speaking as many languages,—a circumstance which did not make it easy to obtain good histories from the patients.

The numbers were roughly —

<i>Cases of relapsing fever</i>		
British	38	1
Indians	404	8
Russians	28	10
Germans	7	1
Greeks	30	9
Armenians	25	6
Arabs	30	3
Jews	3	
Turks	150	16
Cherkas & Chichins	15	8
Roumanians	5	
Italian	1	
Kurds	30	1
Maroccans	5	1
Algerians	30	2

CLIMATE AND BLOOD-SUCKING FAUNA

The weather in 1918 was cold and wet until April, and then mild until the 10th of May, when the hot weather began suddenly. In May and June temperatures up to 43 degrees C were recorded inside a stone room in the hospital.

Lice were extraordinarily prevalent throughout the winter, but diminished in numbers as the weather grew hot and the measures for dealing with them became more effectual. A sensible diminution began in June. Everyone was more or less infected with them, but specially the Turks and Russians. Mosquitoes, both culex and anopheles, were numerous from May onwards, and from June onwards we were troubled by a very minute sand-fly. I never saw a bedbug or a tick. Fleas were fairly numerous up to May.

The whole of the headquarters was overrun with mice, and flies were very numerous during the whole of the hot weather.

THE OUTBREAK OF RELAPSING FEVER

Relapsing fever first made its appearance in April, 1918, and continued till June, and it is this outbreak an account of which I think is of some interest, as, so far as I know, it is the only outbreak described in this part of the world, and the results of treatment were extraordinarily satisfactory. There is no disease I know so satisfactory to the doctor. With a microscope the diagnosis is certain, and with neosalvarsan, and no doubt with other arseno-benzene compounds, the treatment is wonderfully successful.

The course of the epidemic is shown in the following table.

The diagnosis was in each case made microscopically and no case occurred which was clinically relapsing fever, in which, at some stage or other, the spirillum was not found.

THE SPIRILLUM

Method of staining—In all cases thin blood films were examined but I think perhaps a thick drop method would have been better as a routine procedure. The films were stained with Giemsa's stain and examined under 1-12 in oil immersion lens. The spirillum stains rather slowly to a dark purplish blue colour, and loses its stain easily if washed with water containing a trace of acid. This point is of some importance as if—as sometimes happened—the Giemsa did not colour the red corpuscles a nice red one was tempted to improve the appearance of the slide by washing it for a moment in very dilute acid. Its appearance was wonderfully improved, and malarial parasites thereby more easily seen but the relapsing fever spirilla were apt to be lost in the process.

APPEARANCE

The spirillum as thus seen was very variable. It varied in numbers found from none at all (and thus after 15 minutes' search in a case in which it was subsequently found) to many in each field. The thickness varied from ones so thin as to be hardly visible to a coarse organism like a mouth spirochete but in the same slide the thickness was fairly constant. Manson and Thornton who also noticed this variation, even suggest the possibility of there being two varieties of the Sp. Dutton on the strength of it (13). Its length was about 20μ and without accurate measurements seemed to be one of its most constant features (26).

The figures were open and very irregular and in some cases the parasite took the form of a segment of a circle (13). This was possibly a change occurring when the film dried.

The ends were pointed.

The parasites were always found in the blood during some part of the attacks of fever, and never in the intervals when the temperature was normal. Out of 25 cases examined on the first day of the first attack of fever in five cases they were not found but in each of these cases were found on the second day. In one case only one spirillum was found on the first day after a long search and several on the second day (5).

This is a strong indication that the parasites in the first attack reach their maximum number late in the attack rather than early.

I could not find that the number of parasites found in the blood bore any relation to the clinical severity of the disease.

The parasites did not appear to be more numerous at one time of day than another. They were always extracellular, no case of phagocytosis being observed. The injection of neosalvarsan into a vein caused their rapid disappearance from the blood.

Unfortunately owing to want of apparatus and material, attempts at culture of the organism in vitro, and serum reactions could not be tried.

THE VECTOR

The ordinary vector is certainly the louse, (30), (32), (33), (35), except in Africa where it is a tick—the *Ornithodoros moubata*. The bed-bug can carry the disease (29), and mosquitoes have been thought sometimes to do so (49). No one has discovered a flea doing so (13), (47).

There were many indications that our outbreak was due to lice—

(1) The cases were most numerous amongst the sections of the community which were most infected with lice. No cases occurred amongst the hospital staff, who were in daily contact with cases but had special facilities for keeping themselves free from lice. Very few cases occurred amongst the Indian prisoners of war, although these were more numerous than any other nationality. They kept themselves clean.

(2) Several times smears of crushed lice from relapsing fever cases were examined, and on one occasion an undoubted spirillum was found.

(3) There were no—or very few—bed-bugs or ticks, and sand-flies and mosquitoes did not make their appearance till the epidemic had started to decline. The disappearance of the disease corresponded with the disappearance of the lice.

(4) No cases of infection occurred so far as I could find in hospital. The patients were carefully de-loused on admission but relapsing fever cases were in no way isolated from those suffering from other diseases (cf 47).

MODE OF INFECTION

It is probable that infection takes place not so often from bites of an infected louse as from inoculation of a crushed louse into scratches made when the patient feels the irritation of the bite (1), (13).

THE BREEDING OF THE PARASITE IN THE LOUSE

It is generally admitted that the organism breeds and is hereditary in the *Ornithodoros moubata* in Africa, and this is probably the case in the louse elsewhere, but the findings of various observers are not quite consistent (23), (29), (31). Leishman (34) has reported a 'granule clump' formation by the spirillum in the *Ornithodoros moubata* a sort of spore formation and J. Koch (29) a somewhat similar appearance in the louse.

THE CLINICAL COURSE OF THE DISEASE

The incubation period—In this epidemic I had no indications of the length of the incubation period. It is usually given as from 2-10 days (11), (23), (47) but Manson and Thornton found about 7-14 days the usual time with variations from 2 to 17 (13).

THE INFLUENCE OF SEX

In our epidemic only one case occurred in a woman to 65 in men, but this was nearly the proportion of women to men in the section.

Other observers agree that males are much more frequently attacked than females (1), (2), (47)

ONSET

The onset was always sudden, without premonitory symptoms, the temperature rising to 39-40 degrees C in about 12 hours. In the majority of cases the temperature rose in the evening or at night, and rigors were notably absent in distinction from malaria. The usual symptoms due to fever were observed. When first seen, usually on the first or second day, the patients had a peculiar lethargic manner. They were very docile, and rather slow in their movements, and seemed as if weighed down by terrible trouble. They did not (as was often the case with other diseases) try to impress the doctor by the seriousness of their illness. I thought their manner rather characteristic, and that I could usually decide if a patient had this disease or not when he first walked into hospital. I have since found that other observers have noticed a similar manner (13), and Bertier in Serbia (11) and Van Hoof in Africa (3) consider it characteristic. Portcalls in Salonika (4) notes a curious cry, as in meningitis, but with us this symptom was not present. This observer also notes that Kernig's sign often occurs.

HEADACHE

Headache was invariably present, and perhaps, as various observers think (4), (9), more severe than one would expect to be associated with the rise in temperature.

DELIRIUM

Delirium was only present in the one fatal case, and then only late in the attack, and of the low muttering type. This symptom appears to have varied much in different outbreaks. Some observers (16) consider early delirium an important diagnostic sign. While others (4), (17) are aided in diagnosing their cases by the absence of it.

THE TONGUE AND BOWELS

The tongue was usually furred and moist and seldom the dark brown, dry, furred tongue one often sees in typhus. In some cases it remained clean until the third or fourth day of the attack.

The bowels were generally normal, but constipation was more common than diarrhoea.

EPISTAXIS

Epistaxis in the initial stages was only observed in one case. In some outbreaks this has been noted as a common symptom. [Vide (4), (11), and contra (13)]

VOMITING

Vomiting was rare as opposed to Vandyke Carter (1) and others.

RASH

A rash was never noticed, and most observers agree in this. It is difficult to see a rash in a patient covered with louse-bites, as most of our cases were, and though Vandyke Carter, the most

careful observer of the disease, has described one, it is, at any rate, not at all an obvious sign.

THE LIVER

The liver was enlarged at the beginning of the attack in one case, the enlargement subsequently disappearing. This initial enlargement has also been noticed by v Hoesslin (9).

Jaundice occurred in one case without enlargement of the liver. Various observers have described a clinical type of the disease in which jaundice is a prominent symptom, and our jaundiced case fits in fairly well with this so-called 'bilious typhus type' [Vide McCowan (14)]

THE SPLEEN

The spleen was enlarged in 30 per cent of our cases. Many observers agree that this organ enlarges progressively during the periods of fever and diminishes again during the intervals. [Vide (7), (9), (47), and contra (13)] There is no doubt that in most outbreaks this organ is frequently enlarged, but in the epidemic in E. Africa in 1917-18 (13), and in Macedonia in 1917 (5), this does not appear to have been the case and Delille (5) and others consider that in this latter outbreak an enlargement of the spleen indicated concurrent malaria. In the section until the relapsing fever was over we had very little malaria. It is noteworthy that in our one fatal case the spleen was *not* enlarged and this case was of the bilious typhus type in which McCowan says it is always enlarged (14).

A case of spontaneous rupture of the spleen on the fifth day is on record (15).

JOINT AND MUSCLE PAINS

These were complained of in 21 per cent of our cases, but generally not until after the temperature had fallen as a result of treatment with neosalvarsan. In most outbreaks they are noted as common symptoms and some observers think they are important diagnostic signs (4), (9).

HEART AND CIRCULATORY SYMPTOMS

Beyond an increased pulse rate in proportion to the fever these symptoms were not observed. Okuniewski (20) has noted that there is no obvious change in blood pressure in this disease.

NUMBER OF DAYS

Number of case	1	2	3	9	11	13	45	46	64
1st period of fever	8	?	7	7	5	5	7	7	8
1st interval	5	8	8	20		12	6	?	5
1st relapse	5					?	?		
2nd interval	8					?			
2nd relapse	4					16			
3rd interval	13								
3rd relapse	2								
4th interval	16								
4th relapse	1								

I have neglected this figure in the average as I think it probable that this patient, an extraordinary Russian, had a relapse, and did not appear at hospital. He only came to hospital on the last day of his first attack, and then stayed but one day.

THE RELAPSES

The attack of fever, with some or all the above symptoms, in the few of our cases where it was not cut short by neosalvarsan, lasted from five to eight days (average from 61). The fever then fell by crisis as suddenly as it had risen, often to below normal. Great sweating generally accompanied the fall of temperature, and the symptoms in favourable cases were rapidly ameliorated. After an interval of from 5-12 days (average 68) without fever, another attack generally occurred, very similar in its onset and symptoms to the first but generally of shorter duration. In the one case that was carefully observed through four relapses, the periods of fever became shorter and the intervals longer with each relapse.

The lengths of the periods of fever and intervals of the eight of our cases which had at least one period of fever uninterrupted by neosalvarsan are shown in the table above.

COMPARISON OF OUR OUTBREAK WITH OTHERS

In the duration of the attacks and intervals, as well as in the symptoms our cases agree well enough with the classical description of the disease by Vandyke Carter and with most subsequent observers (4), (11) (12), (9).

In the outbreak in Serbia in 1916-17 (6), (7), however the attacks were shorter (3-3½ days, rarely 4 days) and this outbreak seems to have been altogether of a milder character—more than one relapse occurring but very rarely, and the mortality being practically nil.

The differences between our outbreak and the African one described by Manson and Thornton (13) are discussed below.

THE DISEASE AS MODIFIED BY NEOSALVARSAN

After the administration of neosalvarsan the course of the disease is modified, and as in almost all cases this or a similar drug would be given as soon as the disease was diagnosed, it is this modified disease which is of the most interest.

On the administration of neosalvarsan the temperature does not fall until from 12 to 36 hours later (average 22 hours, one case took 48 hours and one 72 hours), and then by crisis. In the cases which subsequently relapsed the time taken for the temperature to fall was longer than in those which were cured by one dose (253 hours against 20 hours). In these cases, also, the time taken for the temperature to fall after the second dose of neosalvarsan was longer than normal (average 274 hours), and this seems to indicate that these cases were less reactive to the drug. On the fall of the temperature the other symptoms were, in favourable cases, all rapidly ameliorated, and the patient was fit to go out of hospital in 3 to 5 days.

In three cases the temperature rose again 2-4 days after the neosalvarsan, but spirilla were not found in the blood. In two of these cases it remained up for two days and the patients then made a good recovery, but in one case it

remained up for six days, until the patient died in a typhoid-like stage. Vandyke Carter has noticed a similar rise of temperature, without spirilla in the blood in some cases during the first interval.

SYMPTOMS OCCURRING AFTER NEOSALVARSAN

I was unable to determine certainly how far the symptoms occurring after neosalvarsan were due to the disease or to the drug. They were, however, such as have been noted as common in cases of this disease which did not have this drug. The chief were severe headache from 2-4 days after the injection (31 per cent) and pains in the joints and muscles (21 per cent). In one case there was actual swelling of a joint (the left wrist).

Epistaxis occurred in 6 per cent of the cases and deafness or pain in the ear in 8 per cent [Noted as a common symptom by Toyota (12) and v. Hoesslin (9)]. Vomiting, irregular pulse, and giddiness occurred in one case each.

RELAPSES AFTER NEOSALVARSAN

In the cases which relapsed after a dose of neosalvarsan, the relapse was much delayed, to from 14 to 30 days (average 190 days). During the interval after their recovery from the first attack (average 46 days) they were apparently quite fit until the relapse, which was similar in its onset to the original attack. In the one case which had a second relapse after two doses of neosalvarsan, each interval was 24 days.

In view of the long interval, it is quite possible that these relapses were really re-infections. Various observers have stated that little or no immunity is conferred by an attack.

The prolongation of the intervals after arsenobenzene compounds has also been noticed by Manson and Thornton (13) and Portocalis (41).

THE ONE FATAL CASE

In the 66 cases only one death occurred $\frac{1}{66} = 1.5\%$, and this case presented some unusual features, which it may be of interest to describe shortly.

The patient was an Indian Mahomedan prisoner of war, who was sent into the headquarters hospital from a small working party, some 30 miles away, across a waterless desert. A film of his blood had been examined, and found to contain spirilla, four days before the patient himself arrived. On admission his temperature was 38.2°C and he gave a history of nine days' fever. He was very weak, his tongue was dry and furred, and he was deeply jaundiced. His spleen was *not* enlarged. At the time of his admission his blood did not contain spirilla, but he was given a dose of 0.3 gr. neosalvarsan intravenously. His temperature fell in 12 hours but very collapsed he was. On the third day the fever returned, and he remained in a typhoid-like state for six days until he died. Five days before his death he developed a painful inflammatory swelling of his left

parotid—a symptom noted by Vandyke Carter in 2 to 3 per cent of his cases

This case is similar to the 'bilious relapsing fever' described by McCowan (14) and others

COMPLICATIONS AND SEQUELÆ

Our cases showed very few complications or sequelæ, possibly owing to the early employment of neosalvarsan. One case of facial paralysis occurred and one case each of bronchitis and conjunctivitis, but it is impossible to determine whether these were coincident accidents or not. Facial paralysis has been noted as 'common' in this disease by De Ruddere (42)

Other observers have recorded numerous complications, particularly of the nervous system, both psychosis (19) and paralysis (18) and meningitis (3). Bronchitis was a common complication in E. Africa in 1916 (13)

ASSOCIATION WITH OTHER DISEASES

Both typhus and malaria are often associated with this disease. Typhus one would expect since it also is louse-carried and occurs under similar conditions. At Tel Hadî we had no typhus, but in other parts of Turkey I am fairly certain that the two diseases occurred simultaneously, and cases of relapsing fever were diagnosed 'atypical typhus' for if such an outbreak occurs, it is not easy to distinguish the two without a microscope. An outbreak of either means that conditions are ripe for the spread of the other and its concurrence should be watched for.

Three of our cases had concurrent malaria, about the proportion to be expected from the incidence of the latter disease. The clinical picture is confused by superadded malaria, and some French writers (5), (6), (7) have divided their cases into three classes according as malaria is absent, coincides with or follows the relapsing fever. Duchamp (28) even suggests there is a sort of symbiosis of the two parasites. With a microscope the differentiation is easy.

DIAGNOSIS

With a microscope diagnosis is easy and certain during the attacks, with the proviso that the spirilla are sometimes not to be found continuously throughout the periods of fever.

If the case is first seen after the initial attack is over, diagnosis is not generally possible until a relapse occurs. Van Hoof (3) in E. Africa has found that during this disease there is a leucocytosis of myelocytes and large mononuclears and a corresponding relative diminution of polymorphonuclears and small mononuclears, and suggests this can be used as an aid to diagnosis during the intervals when the spirillum cannot be found.

Without a microscope, however, the disease can rarely be diagnosed with any certainty until the first relapse, and an outbreak of this disease demonstrates very well how soon the cost of providing a bacteriological outfit is repaid in the lessened amount of sickness. This point is not

always conceded even in England, by the layman. In Turkey, and I think often in Germany, a microscope is looked on as an unnecessary luxury except for great bacteriological experts.

TREATMENT

There is only one form of treatment worth considering—the administration of an arseno-benzene which has a specific action on the spirillum. Obviously while the fever is high, the patient must be kept in bed, on a light diet, the bowels must be attended to, the headache may be treated with pyramidon and so forth, but the crux of the matter is—which and how much of the arseno-benzene compounds should be given and by which route?

The best route is undoubtedly direct into a vein. In three of our cases neosalvarsan was injected intramuscularly into the buttock, but it was found that this gave rise to very severe pain at the time of injection and inflammation afterwards. None of the cases actually developed an abscess which had to be opened, but one case appeared very nearly to do so. In the cases treated by intravenous injection, with the technique adopted no cases of the slightest local inflammation occurred, and the pain was limited to the prick of the needle.

As other observers (43) have recorded local trouble after intravenous injections of concentrated neosalvarsan and I have never come across a technique quite similar to the one adopted, I venture to give it at length.

THE TECHNIQUE ADOPTED FOR INTRAVENOUS INJECTIONS OF NEOSALVARSAN

The patient is given a strong purge, time is allowed for it to act, and if necessary the purge is followed by an enema. He is given no food for four hours before injection.

Two hypodermic syringes, one at least of 10 cc and two interchangeable needles are boiled in a clean saucepan in distilled water. The tube of neosalvarsan is scratched with a file and rubbed over with alcohol.

Meanwhile the patient is laid flat on a couch, his arm bared to the shoulder, the hollow of the elbow painted all over with iodine, and a piece of bandage tied round the upper arm tight enough to compress the veins. If the veins are indistinct one or two suitable ones are marked with indelible pencil before painting with iodine.

The operator washes and disinfects his hands as for an operation, fits together the two syringes, and draws up about 3 cc of the boiled, and still hot, distilled water into the 10 cc one. He breaks the neck of the neosalvarsan tube, and squirts the 3 cc of water in. The neosalvarsan dissolves at once, and is drawn up into the syringe, and distilled water drawn up till the total bulk is 6 cc. Any air is expelled and this syringe placed ready across the saucepan.

The operator now takes the other syringe and pushes it through the skin of the patient into, and a little way along inside, a vein, drawing

up some blood to make sure he is properly in. If he should, by accident, go through the vein and out the other side, as shown by a rapidly increasing local swelling, the syringe should be at once withdrawn and the operation restarted on another vein.

The needle being properly in, the bandage round the upper arm is loosened and the needle is left in its place while the syringe with the solution of neosalvarsan is substituted for the other syringe. Should a drop be spilt in the process it is immediately mopped up.

The neosalvarsan is now injected slowly and steadily at about the rate of 1 c.c. per minute, and when the injection is complete before removing the needle a few c.c. of blood are drawn up and returned two or three times to wash out any residual neosalvarsan in the syringe or needle. The syringe is then depressed so that the side of the vein comes against the hole at the end of the needle and the piston again withdrawn so that a partial vacuum is created inside, and the syringe and needle then quickly withdrawn. By this means a trace of neosalvarsan if still left inside the needle is sucked inside the syringe during withdrawal and not left in the tissues of the arm. It is not difficult to do.

A drop of collodion is put on the wound and a pad of wool. The patient is kept lying flat on the couch for at least one hour and is then taken away on a stretcher, put to bed, and kept on milk diet until the temperature falls.

By this technique none of the neosalvarsan can come in contact with the subcutaneous tissues of the arm. It should be remembered that any blood left in the syringes or on the patient's arm is infectious, and steps must be taken to destroy the organisms in it.

THE DOSAGE

The conclusion arrived at from observations in this outbreak was, that 0.45 gram neosalvarsan intravenously was the best dose.

In 30 cases 0.3 gram was given, and in eight of these cases subsequent relapses necessitated a further dose of 0.3 gram, and in one case two further doses. Amongst those 20 cases that had 0.45 gram in the first place, no relapses occurred. Some observers (3), (13), (42) have noted that neosalvarsan is more effective if given in the first attack, and we were fortunate in that respect in seeing our cases early—only three cases being treated with intravenous neosalvarsan for the first time during a relapse. Of these cases one had 0.45 gram and two 0.3, and none of them relapsed.

Patients suffering from this disease are said not to bear large doses of neosalvarsan well, and it is desirable that only just an adequate dose should be given.

The average time in hospital, after receiving an injection, of those that received 0.45 was 3.2 days, against 4.3 days in the first case of those

who had 0.3 gram, and a subsequent 6.25 days in the eight that relapsed.

The average time in hospital of the three cases who did not receive neosalvarsan, but who were not lost sight of, was 40.6 days, and of the 58 cases who received it either intravenously or intramuscularly was 6.8 days.

A table showing the results of treatment

Number of cases	Attack	Dose of 0.14	Hours for temp to fall	Days in hospital after injection	
20	1st	0.45	19.8	3.15	} No relapses
1	2nd	0.45	24	4	
20	1st	0.3	19.2	4.2	
6	1st	0.3	30	5.5	} Relapsed & given another 0.3 gram
1	1st	0.3	24	7	
1	1st	0.2	12	3	No relapse (a boy)
2	1st	0.3 twice			No relapse
1	During interval	0.3	Died 9 days later		
1	1st	0.3 into buttock	12	3	No relapse
1	1st	0.45 into buttock	12	31	One short relapse
2	1st	do	12	9	Relapsed and was given 0.3 intravenously. Good recovery

ON THE USE OF OTHER DRUGS THAN NEOSALVARSAN

In the treatment of our outbreak, neosalvarsan was the only one of the various arseno-benzene compounds tried because it was the only one we had but from the number of papers (11) (40), (42) (43), (44), (46) I have since found written to show other drugs are just as good as neosalvarsan, I gather that the latter drug is the best.

It is often stated (21) (50) that neosalvarsan does not work so well in this disease in Africa as elsewhere [Hegler (10) says the same thing of Palestine] and the Belgian doctors in E. Africa recommended 'Satoxyl'* in preference to it. Manson and Thornton have however, concluded, after a very careful trial of many drugs including satoxyl that novarsenobillon is the best. I have not been able to discover what, if any, is the difference between this and neosalvarsan.

Of the drugs other than arseno-benzene compounds, Arrihenal (di-sodium-methyl-arsenate) is the only one I can find reported to have much effect, and this is recommended as a substitute for neosalvarsan when the latter is difficult to obtain by Dumitresco-Mante (46).

* Satoxyl is —

Atoxyl	10 grammes	} Dose 3—4 c.c. intramuscularly twice weekly
Mercury Perchl	0.3 gram	
Pot iodide	2.5 gram	
Water	to 100 c.c.	

Serum treatment has not so far given very good results (41)

PROPHYLAXIS

The obvious prophylactic measure is to kill the vectors—in this outbreak, lice,—and the most important fact in devising schemes to this end is that lice and their eggs are easily killed by a comparatively low degree of dry heat [55°C for 30 minutes or 60°C for 15 minutes (50)]

In ordinary civil life, if one keeps oneself reasonably clean, one does not get lice, and the ordinary sanitary measures in such a country as England are quite a sufficient prophylaxis against the spread of this disease, but with troops under war conditions it is different, and during the war many elaborate and excellent schemes for de-lousing (according to Nuttall the word should be 'lousing') the troops were devised. These vary with the means at one's disposal, and to go into the matter is beyond the scope of this paper.

In the Tel Hadî hospital, our method, which proved quite effectual was, shortly —

Each patient on admission was deprived of all his clothes, shaved of all hair, and given a hot bath with soap. He then, when clean, was supplied with clean hospital clothing and clean bedding, and his own clothes, after being baked in a dry heat of more than 60°C for 15 minutes, were stored till he left the hospital.

All the hospital mattresses, bedding, linen, etc., were regularly baked in rotation. The clothing of the hospital staff was baked about once a fortnight, or oftener if any of them found lice in their things.

The floors of the hospital were washed or sprinkled with a suspension of chloride of lime in water.

Unfortunately, chiefly owing to the scarcity of fuel, we could not extend such a scheme to all the inhabitants of the section.

The heat of a tropical midday sun is quite sufficient to kill lice, and Wanhill (51) has dealt successfully with an outbreak of relapsing fever by moving the troops attacked out into camp on the banks of a river where they could wash themselves and their clothing and use the sun to destroy the lice and eggs. The lice in the houses occupied were left to starve, which they soon do if deprived of animals to feed on.

As remarked above, any blood, and possibly other fluids, coming from a relapsing fever patient, during the fever at any rate, is very infectious and must be destroyed. Scratching should be avoided, both by the prospective patient to allay irritation, and by the barber when shaving. As bedbugs can carry the disease these should also be dealt with.

In Africa, against *Ornithodoros moubata*, prophylaxis consists in personal precautions at night when the ticks feed, and disinfection of the tick-infected houses [Vide (50), page 218, etc.]

APPENDIX

As an appendix I have added three notes —

- (1) On the invasion of tissues other than the blood by the spirillum,
- (2) On the mortality in other outbreaks,
- (3) On the varieties of relapsing fever, and a list of authorities quoted in the paper, with short notes to indicate the nature of the book or paper, arranged under the following headings —

- (1) General accounts of outbreaks
- (2) On special types of the disease, etc
- (3) On the spirillum and the vector
- (4) On the treatment
- (5) Accounts of the disease in text-books, etc

ON THE INVASION OF OTHER TISSUES THAN THE BLOOD BY THE SPIRILLUM

The invasion of tissues other than the blood by the spirilla has occasionally been reported. Brault and Montpelier (25) have found it in the sweat and tears, and perhaps in the cerebro-spinal fluid. Two other observers (4), (13), however, agree, that it is never present in this latter fluid, even in cases showing cerebral or meningeal symptoms.

Its presence in the urine too is very doubtful. Dudgeon (27) found a spirillum in 30 per cent of the urines of a series of relapsing fever cases. But Stoddard found that 46 per cent of the urines of healthy subjects treated similarly showed spirilla. Manson and Thornton (13) never found it in the urine, nor according to them does it seem to be present in the sputum unless contaminated by blood.

ON THE MORTALITY IN OTHER OUTBREAKS

The mortality in this disease, which used to be called 'famine fever,' is no doubt influenced by the often added condition of semi-starvation of the patients. It shows, however, I think, a tendency to decline, due perhaps to the introduction of treatment by arseno-benzene compounds.

Vandyke Carter's mortality was 18.02 per cent and in many of the outbreaks before his time was even higher, up to 50 per cent. In recent outbreaks it has varied from nothing or very little in Serbia in 1916 (6), and Macedonia in 1916-17 (4), (5), and E. Africa in 1917-18 (13) to 8 per cent in Manchuria in 1918 (12) and 17.18 per cent in Albania in 1916 (8).

ON THE VARIETIES OF RELAPSING FEVER

Clinical varieties—It is usually considered that there are at any rate two varieties of relapsing fever, the European and the African—the disease as seen in India, America and as recently described in Manchuria (12) not being essentially different from the European variety.

A very excellent account of the disease as seen in E. Africa, from observations on no less than 1,500 cases, has recently been published by

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Officiating Chemical Examiner to the Government of the Punjab

										Turk	Turk							
10										Turk	Turk							
9										Turk	Turk							
8					Turk			Turk		Russ	Turk							
7					Turk	Turk		Turk		Russ	Turk							
6					Russ	Russ		Greek	Turk	Chekas	Turk							
5					Russ	Russ		Greek	Russ	Arm	Greek	Turk						
4					Greek	Chekas		Greek	Russ	Arm	Greek	Ind	Turk					
3					Turk	Greek	Chekas	Chekas	Greek	Arab	Ind.	Arm	Greek	Arm				
2					Russ	Chekas	Arm	Chekas	Ind	Egg	Ind	Arm	Ind	Arab				
1		Ind	Ind	Russ	Chekas	Alg	Alg	Chekas	Maroc	Kurd	Germ	Ind	Arab					
	1	7	14	21	28	5	12	19	26	2	9	16	23	7	14			
	APRIL				MAY				JUNE				JULY					

Manson and Thornton (13) The resemblances between this disease and the European or Indian variety are much more striking than the differences and there is hardly a feature in this description that cannot be matched in some outbreak or other in other continents

The differences—In the African disease, the temperature remains up in the first attack, for a variable period 'usually for three days' [(13), page 107] and in subsequent attacks for but two days or less (Precise details are wanting) This is the period given in the outbreak amongst the Serbs in 1916-17 (6), (7) but the rule in the European variety is 5-7 days Vandyke Carter reckons in average of seven days for the first attack, but says this figure is probably too big, as the patients in giving their histories were prone to exaggerate the length of their illness before appearing at hospital

The number of relapses in Africa amongst the W African natives living in E Africa is ordinarily five and up to eleven Amongst the E African natives the relapses are as a rule fewer (in 30 per cent none at all), but up to nine have been observed In other continents more than four hardly ever occur The latter ones of these numerous relapses in the African variety are rises of temperature to from 99 to 100 degrees F for a few hours, and consequently would in all probability be overlooked unless the patients were under very careful observation That they were true relapses is shown both by their regular periodicity, and by the appearance of spirilla in the blood

In Africa the common vector is the *Ornithodoros moubata* and in other continents the louse Although lice were prevalent in E Africa, Manson and Thornton bring some evidence that they never carried the disease there, but the evidence is not conclusive As Toyota remarks the *Ornithodoros* can carry the disease if introduced into other countries, and other animals, e.g., the bed-bug, can and probably do, sometimes carry it

Manson and Thornton found that spirilla were most plentiful in the blood at the beginning of the attacks and often disappeared towards the end This is directly opposed to observations in other continents, where the maximum number of spirilla in the blood is not reached before the third day of the fever

The observation of various previous workers (21), (50) that the African variety does not react so well to arseno-benzenes is not confirmed by Manson and Thornton

Differences in the parasite—Four varieties of the parasite are often described, the *Sp Obermeieri* in Europe, the *Sp Carteri* in India, the *Sp Duttoni* in Africa, and the *Sp Novyi* in America, chiefly owing to a paper by Novy and Knapp (22) in which this division was advocated Both morphological and serum reaction differences have been described in the parasites and differences in the clinical diseases they produce

The clinical differences have just been dealt with

Nuttall (23) and Bayon (24) in 1912, Macfie and Yorke (26) in 1917, and Toyota (12) in 1919 have all concluded that there are no recognisable morphological differences between organisms from different parts of the world

The serum reaction differences are by no means clear and precise and various observers do not agree at all amongst themselves as to them Toyota (12), after a long and careful research, thinks that the so-called species can be transmitted by prolonged passage through animals I think this observer (who although he writes in that language is not a German) comes to a safe conclusion in saying "Es ist unserem jetzigen Wissen nach unmöglich die Rekurrensspirochaeten in verschiedene Arten einzuteilen"

GENERAL ACCOUNTS OF OUTBREAKS

- (1) Vandyke Carter, H
Spirillum Fever London, 1882
A large book of 450 pages, devoted to a most careful and detailed description of the disease as seen in Bombay in 1877-80
Sir Leonard Rogers refers to it as the classical account of the disease
- (2) Walker, E A
Spirillum Fever in India L. M. S. Gazette, 1905, p 320
Only a letter with some details, from memory, of an outbreak on the North West Frontier
- (3) Van Hoof, L
Note préliminaire sur la fièvre récurrente parmi les troupes dans l'Est Afrique Allemande Bull. Soc. Path. Exot., Paris, 1917, x, pp 786-791
A clinical description of an outbreak in East Africa
- (4) Portocalis, A
Sur l'épidémie de la fièvre récurrente observée récemment en Macédoine Bull. et Mém. Soc. Méd., d'Hôp. de Paris, 1917, 3, s. xli, p 780
A clinical description of the outbreak amongst the Greeks in Macedonia in 1916-17 (800 cases)
- (5) Armand Delille, P Garsin and Lemaire, H
Les principaux caractères de la fièvre récurrente à l'armée d'Orient Bull. et Mém. Soc. Méd., d'Hôp. de Paris, 1917, 3, s. xli, pp 778-780
A clinical description of a small outbreak amongst the French troops in Salonika in 1916-17 (50 cases)
- (6) Duchamp, C J
Contribution à la pathologie des Balkans La fièvre récurrente des Serbes Bull. Acad. de Méd. Paris, 1917, 3, s. lxxvii, p 372.
A clinical description of the disease amongst the Serbs in 1916
- (7) Duchamp
La fièvre récurrente chez les Serbes. Prog. Méd., Paris, 1917, 3, s. xxxii, 10-12.
A clinical description of an outbreak in Servia 1916-17 (71 cases)
- (8) Weiner, E
Ueber eine Rekurrensepäpidemie Méd. Klin., Berlin, 1917, xvi, p 1043
A description of an outbreak in Albania in 1916-17 The statements are often very vague and statistical details are wanting
- (9) Von Hoesslin H
Zur Klinik des Rückfallfiebers Münch. Med. Wochenschr., 1917, lxi, pp 1065 & 1106
A long paper with a very full clinical description of the disease The therapy is not well treated of

- (10) Hegler
Erfahrungen über Febris recurrens Wein Klin Wochsch, in Palastina 1917, xxx, p 547
A short report of a medical meeting and discussion. One of the speakers a Dr Apostolides gives shortly clinical details of more than 950 cases he had had in Palestine
- (11) Bertois
La fièvre récurrente Jour de Méd et Chir prat Paris, 1918, lxxxix, pp 932-946
A general description of the European variety of the disease, clinical and pathological. The world distribution is dealt with at length
- (12) Toyota, H
Studien über die Recurrens spirochaeten in Mandschurien Kitasato, Arch Ex per, Med, Tokio, 1919, pp 13-84
A long and careful paper describing —
(1) Various experiments on the inoculation of spirilla into animals, and serum reactions
(2) The clinical features of an outbreak in Manchuria (70 cases)
- (13) Manson, J K & Thornton, L H D R A M C Journal, East African Relapsing Fever 1919, August pp 97-116 Sept, pp 193-216
A long and very good account of the disease in East Africa (1,500 cases)
- ON SPECIAL TYPES OF THE DISEASE, etc
- (14) McCowan, W T
Bilious typhus and relapsing fever I M S Gazette 1906, pp 387-396
A detailed clinical account of the bilious typhus type of the disease
- (15) Jansig & Jurincoe
Ueber einen Fall von Milzruptur bei Febris recurrens Wiener Klin Wochsch, 1917, xxx, p 1651
- (16) Porat, A
Delire et réactions psychomotrices dans la fièvre récurrente de l'Inde Bull Soc Path Exot, Paris, 1917, x, pp 532-536
On early delirium as a prominent symptom in N Africa
- (17) Parrot, L
Du délire et des réactions psychomotrices dans la fièvre récurrente algérienne Bull Soc Path Exot Paris 1917, x, pp 692-694
On the absence of delirium in N Africa
- (18) Yacoub, K
Spirochaetal dysentery and post spirochaetal paralyses during an epidemic of relapsing fever Practitioner, Lond 1917, xcix, pp 487-491
A good paper, clear, short, and to the point
- (19) André Thomas, Loygue & Levy Vallensi, J
Accidents nouveaux au cours du typhus récurrent considérations sur l'ataxie aiguë Rev neurol, Paris 1918, xxx, pp 216-220
Only one case
- (20) Sterling Okunewski, S
Blutdruck im Verlaufe von Rückfallfieber Deut Med Wochsch, 1918, p 265
Concludes—'Es wird also im Laufe von Rückfallfieber meist kein deutlicher Einfluss der Krankheit auf den Blutdruck beobachtet'
- (21) Redford, J H & Duke, H L
A case of Spirillum fever in (German) East Africa R A M C Journal, 1919, Jan, pp 78-81
- ON THE SPIRILLUM AND VECTOR
- (22) Novy, F G & Knapp, R S
Studies on *Sp Obermeieri* and related organisms Jour Infect Dis cases 1906, Vol III, pp 291-303
A paper of over 100 pages and mainly responsible for the division of relapsing fever spirilla into the four species
- (23) Nuttall, G H F
Herter Lectures, 1912 I Spino Parasitology, 1912, Vol v, pp 262-274
A very good summary of the evidence for the louse as the vector. The author concludes that there is only one species of *Sp recurrentis*. Some interesting notes are given on the life history of the louse from experiments
- (24) Bayou, H
Experimental transmission of the spirilla of European relapsing fever to rats and mice Ibid, p 135
Concludes that there is no morphological difference between *Sp recurrentis*, *Sp Duttoni* and *Sp Novy*
- (25) Brault, J & Montpellier, J
Note sur la présence du spirille de la fièvre récurrente en Nord Afrique dans quelques liquides et excreta de l'homme Bull Soc Path Exot, 1914, Vol III, p 172
The 'liquides et excreta' are the cerebro spinal fluid, the sweat and the tears
- (26) Macfie, J W S & Yorke, W
The relapsing fever spirochaetes Ann Trop Med & Parasitol, Liver pool, 1917, xi, 81-85
Concludes that there is no morphological difference between the various species of *Sp recurrentis*
- (27) Dudgeon, L S
Examination of the urines in cases of relapsing fever occurring in Macedonia Lancet, London, 1917, n, pp 823-825
The author found spirilla in 27 out of 82 cases, but it is probable that these were not *Sp recur*
- (28) Duchamp, C J
Fièvre récurrente Presse Med, Paris, 1917, xxx, 210
Suggests a symbiosis of the *Sp recurrentis* and the malaria parasite
- (29) Koch, J
Zur Uebertragung des Erregers des europäischen Rückfallfiebers durch die Kleiderlaus Deut Med Wochsch, 1917, xlvii, pp 1066-1074
The author thinks the spirilla breed in the louse and gives good microphotographs of clusters of spirilla somewhat resembling those found by Lieshman (v 134)
- (30) Mayer, M
Die Uebertragung des Rekurrens durch Lause Munch Med Wochsch, 1917, lvi, 70
- (31) Mayer, M
Zur Uebertragung des Erregers des europäischen Rückfallfiebers durch die Kleiderlaus Deut Med Wochsch, 1917, xlvii, p 1231
The author doubts the breeding of spirilla in the louse
- (32) Wiese, O
Zur Uebertragung des Rückfallfiebers implicating the *P Capitis* and *P pubis* as well as the *P Vestimentorum* as European carriers Deut Med Wochsch, 1918, pp 60-62

- (33) Töpfer, H
Zur Uebertragung des Erregers des Deut Mod
europäischen Rückfallfiebers Wochsch, 1918,
durch die Kleiderlaus p 279
- (34) Leishman Sir W B
A note on the "granule clumps" Ann de l'Inst, Pasteur Paris
found in ornithodoros moubata 1918, xxvii, 49-
and their relation to the spirilla 59
of African relapsing fever
A short paper These "granule clumps" seem to be functionally at any rate a kind of spore formation
- (35) Lloyd, Li
Lice and their menace to man Oxford Med Publ
1919 (Relapsing fever, p 100)
A treatise on the habits and life of the louse

ON THE TREATMENT

- (36) Inversen Ueber die Wirkung des Munch Med
neuen Arsenpräparates Erlich's bei Wochsch, 1910,
Rekurrenz No 5
52 cases with four relapses
- (37) Smiroff Die Anwendung der Sal Deut Med Wochsch,
varsan bei febris recurrens 18 Ap 1912
201 cases with 17 relapses
- (38) Conseil, E & Bienassiss, E.
Traitement de la fièvre récurrente Buh Soc Path
par le néosalvarsan d Erlich Exot, 1912, Vol
V, p 476
On the advantage of neosalvarsan over salvarsan
- (39) Folev H & Violette, C
Traitement de la fièvre récurrente Ibid, 1914, Vol vii,
par le néosalvarsan et l'Olarsol p 596
12 cases were treated with 914, with no relapses
- (40) Conseil, E
Le Galyl et Ludyl dans le traite Ibid, 1914, Vol vii,
ment de la fièvre récurrente p 101
Thinks Ludyl and Galyl as good as 914, but only tried them on 4 and 6 cases, respectively
- (41) Portocals, A
Le traitement de la fièvre récurrente Compt rend Soc
Compléting (4) Galyl was used in de Biol, Paris
82 cases with indifferent results 1918, lxxvi, 273
- (42) De Ruddere
La fièvre récurrente spirillaire, et Arch Med belges
son traitement aux troupes de Brux 1917, lxx
l'Est Africain Allemand. pp 710-713
Recommends "satoxyl" in preference to neosalvarsan
- (43) Muhlens, P
Arsalytsbehandlung besonders beim Deut Mod
Rückfallfieber Wochsch 1917
xliii p 1167
Thinks ar-salyts just as good as neosalvarsan
- (44) Kostoff, K H
Arsalytsbehandlung beim Rückfall Ibid, p 1169
fieber
The author is a Bulgarian colleague of the above "Armeehygieniker Herr Genemleberarzt Prof Muhlens, and tried both ar-salyts and 914 under his instructions
- (45) Löwy R
Zur Klinik & Therapie des Rückfall Med Klin, Berlin
fiebers 1918, xiv, p 62
A short paper and not very precise His treatment is 0.45 gram of 914
- (46) Dumitresco Mante
Injections intraveineuses d Arrhenal Presse Med, Paris
dans la fièvre récurrente 1918, xxvi, pp
155-156

The author recommends Arrhenal 3 gram intravenously, but only tried it on 8 cases His dosage is 15 times the maximum dose given in the Extra Pharmacopœia

ACCOUNTS IN TEXT BOOKS, Etc

- (47) Babonneix, L
Recurrent typhus or relapsing fever, Monde Med, 1916,
etc xxvi, pp 193-212
A general description of the disease but not drawn to much extent from the author's own cases
- (48) Rogers, Sir Leonard
Fever in the Tropics 1919
An excellent summary of the disease as seen in India, and the clinical differences between this form and the African
- (49) Castellani & Chalmers
A Manual of Tropical Medicine 1919
- (50) Memoranda on Medical Diseases in H M Stationary
the Tropical and Sub Tropical War Office, 1919
Areas
Particularly good summary of the Relapsing Fever, pp 214-221
- (51) Wanhull, Lt Col, R A M C
Relapsing Fever A Rough, but R A M C Journal,
Effective Method of dealing with 1919, Aug, p 178
the louse in India

REFERENCE TO ARSENO BENZENE COMPOUNDS IN THE TREATMENT OF RELAPSING FEVER

SALVARSAN	(13),	(36),	(37),	(38)
NEOSALVARSAN	(13),	(38),	(39),	(40), (45)
ARSALYTS	(bis methyldiamino tetramino arseno benzol)	(43),	(44)	
OLARSOL	(? composition)	(39)		
LUDYL	(Phenyl disulph amino tetraoxy diamene diarseno benzene)	(40)		
GALYL	(Tetra oxy diphosphamino diarseno benzene)	(11), (13), (40), (41)		
ATOXYL	(Sodium amino arsenate)	(13)		
SATOXYL	(r, p 21)	(13)	(42)	

NOTES ON INFLUENZA

By J H McDONALD,

LIEUT-COLONEL I M S

DURING the winter of 1918-19, the bacteriological examination of sputa in cases showing influenzal symptoms revealed the almost invariable presence in large numbers of a Gram-negative cocco-bacillus—an organism not found prior to this in pneumonic conditions in Abbottabad. The cultivation of this proved it to be the coli type of the Friedlander group. In the face of general opinion it was difficult to associate this with the epidemic then prevailing, but the fact that in five cases this organism was obtained in pure culture from pleuritic effusions naturally raised a doubt, which could not be removed by further observations owing to the cessation of the disease. During this last winter, noting again the predominance of this cocco-bacillus, I carried out observations in connexion with over 200 cases which have forced me to the conclusion that this organism is playing a great, if not the chief, part in the present epidemic for the following reasons—

1 Its invariable predominance in the sputa of nearly all (95 per cent) laryngeal and pneumonic cases and its presence almost in pure culture in over 40 per cent of the cases

2 The total absence of any organism like the influenza bacillus or pneumococcus even on repeated examinations of sputum from the same case and entire failure to obtain evidence of either even on selective media

3 Its highly pathogenic properties— $\frac{1}{2}$ cc of a broth emulsion injected under the skin being a lethal dose for a quail or pigeon with death in 8 to 12 hours and 5 cc for a rabbit or guinea-pig proving fatal in 18 to 24 hours. The organs show all the signs of acute septicæmic poisoning and the cocco-bacillus is found in, and can be cultivated from, the blood

Morphology—Its pleomorphism is evident in both sputum and cultures

In cultures its variations are dependent on the medium and on the cultures being primary or secondary. The following table shows the development according to these factors —

A. Medium	B Primary Culture	C Secondary Culture
(1) Blood Agar	Short stout bacilli with coccal forms	Smaller cocci with more slender and frequently longer bacilli
(2) Ordinary Agar	Mainly coccal and diplococcal forms	All coccal forms
(3) Broth	Mixed coccal, diplococcal and bacillary forms	Similar
(4) Boiled white of egg	Mixed forms as in (3), but smaller and with but few bacillary forms	Mainly coccal and diplococcal
(5) Gelatine Slope	Seldom obtained and then showing only coccal forms	Nil
(6) Gelatine Stab	Growth scanty and limited to surface—chiefly coccal forms	Nil

Transference from (3) or (4) to (1) shows the same as C (1) usually and rarely B (1)

Cultural characteristics—The growths on various media correspond with those of Friedlander's pneumo-bacillus differing, however, in the following respects —

(1) Its growth on various media is by no means exuberant except in broth and sometimes on blood-agar and boiled egg-white. On ordinary agar and gelatine only the short stout cocco-bacillary form develops as a rule, and then scantily, showing mainly coccal forms. Even when extensively prevalent in sputum, cultivations prove a failure

(2) Encapsulated forms are rarely seen in sputum or cultures unless the latter be passed through a bird or animal, when they become evident

(3) The lanceolate form is rarely seen, the bacillus being either an elongated coccal form or sausage-shaped. Except the diplococcal form, pairing is seldom seen, the bacilli grouping themselves in palisade fashion

Relationship of germ to disease—A comparison between the conditions found clinically and bacteriological findings tends to strengthen the opinion that this cocco-bacillus plays a great, if not the chief, part in the causation of the

disease. The following table represents the comparative states —

Bacteriological	Clinical
1 Short stout cocco bacillary forms predominant	Symptoms very severe Septicæmic conditions marked, involvement of lung not proportionate Sputum thick and gangrenous (green and foul smelling)
2 Coccal and diplococcal forms predominant	Symptoms vary according to severity of infection Septicæmia as marked as (1) if infection severe sputum yellowish or yellowish green semi liquid with tinges of rust or bright coloured blood
3 Coccal forms only	Symptoms mild Septicæmia not marked Sputum yellowish and semi liquid

Mode of infection—This, as far one can see, is entirely through the respiratory system

Nature of infection—This appears to be a sapræmia more than a septicæmia for the following reasons —

(1) Repeated examinations of blood smears taken *ante mortem* from the peripheral circulation and *post mortem* from the heart and lungs show the presence of no organism while at the same time the sputum may be swarming with them

(2) Cultures made from the blood, ante- and post-mortem, prove negative

(3) Cases clinically showing no pulmonary abnormality till the patient is moribund and then only a congestive condition, prove fatal from a pharyngeal or laryngeal affection, the sputum alone exhibiting the presence of the cocco-bacillus in one of its forms

Chronic infections—From my observations it would appear that the existence of a chronic influenzal infection has not been fully realized. Cases not infrequently met with are considered, owing to the hectic nature of the temperature and signs of pulmonary disintegration or empyema to be due to tubercular infection. Repeated examinations of the sputum reveal no tubercle bacilli, but the presence in considerable quantity of the same micro-organism with staphylococci or streptococci. Sajous in his *Encyclopedia* points out the occurrence of such cases in pure influenzal affections and Besson in his *Manual of Bacteriology* shows the effects of mixed infections. We ought, then to remember not only the possibility of such chronic conditions but the dangers arising to the public by neglect of measures to prevent the spread of the disease for most people will keep clear of a patient acutely infected but in ignorance will not avoid a chronic case

Treatment—Much has been written and said about gargles of various kinds. While not depreciating the value of these one is brought face to face with incontrovertible facts, showing how such useful information can prove a source of railery for the misbeliever. The facts are these —

(1) What percentage of the Indian population will actually take the trouble to gargle

properly with any medicated solution even once a day? The very admixture of any such substance even in drinking water results in its total avoidance.

(2) Spirituous forms of medication

The penetrating power of spirits when inhaled makes these far more efficacious, and as inhalations they have in my hands proved more successful in arresting the development of general symptoms if used at the initial stage. The combination of creosote or iodine with tinct benzoin and rectified spirit acts rapidly and most effectively. The ease with which inhalation can be done by sprinkling the solution on a piece of lint makes it more acceptable to people generally.

A Mirror of Hospital Practice

IMPROVISED TRIPLE-BLADED BAMBOO GASTRO-ENTEROSTOMY CLAMPS

By KHURSHED HUSAIN, M.B. BCh (Edin)

District Civil Surgeon Raichur

I am sending an account with a drawing and a sample of the "Improved Triple-bladed Bamboo Forceps," used successfully in Raichur Dispensary for posterior gastro-enterostomy operation.

to pyloric stricture was waiting for operation. He was very uncomfortable, and was so inclined to commit suicide if not operated on, that on not receiving any instrument from Bombay I prepared a set of forceps from bamboo and performed the operation on 15th March, 1920 (11th Ardebakist 1329), and found the improvised triple-bladed bamboo forceps more handy and suitable. The diagram of it is given below in Fig 2.

Figure No 1 is Moynihan's triple-bladed stomach clamp and is metallic, blades of it are smooth and have no curve in them.

Figure No 2 is the improvised triple-bladed bamboo forceps. The following are its advantages —

1 It is easily available and prepared, as it is made up of only a piece of bamboo and needs only a knife to prepare it.

2 It is so cheap as not to cost even two dabs whereas metallic triple-bladed forceps cost more than Rs 40.

3 It is sterilised well simply by boiling. Bamboo blades I found on boiling lose their rigidity and become more elastic and conveniently flexible which is especially needed. For the operation as a precaution I had prepared four sets of forceps, one I sterilised by boiling others I sterilised by the application of tincture of iodine spirit, carbolic acid, etc., but I found the forceps sterilised by boiling served the purpose well.

4 The tear in the bamboo gives a good and handy grip for holding the portions of

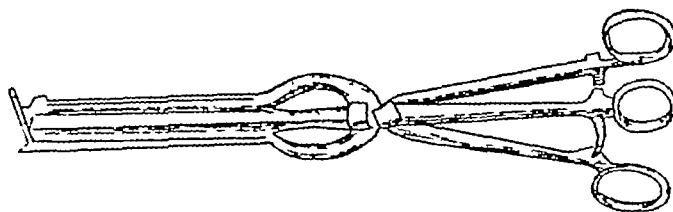


FIG 1 —Moynihan's Triple bladed Stomach Clamp

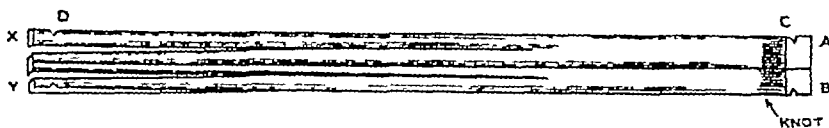


FIG 2.—Improved Triple bladed Bamboo Clamp for Gastro-enterostomy.

Gastro-enterostomy operation is performed usually by triple-bladed forceps, of which there are many varieties in use, such as —(1) Moynihan's triple-bladed stomach clamp, (2) Roosevelt's triple-bladed stomach clamp, (3) Mayo-Robson's triple-bladed stomach clamp, and others.

Having none of these in the dispensary, I ordered for one from Bombay, as a case of huge dilated stomach of 18 years' standing, due

to bowels. The grip is made firmer or looser by placing the portion of bowel closer or further from the joint and also by simply tying a piece of thread at the ends of the blades.

5 The grip of bamboo blade is not so tight as to clamp the stomach tightly crushing its blood-vessels, etc., so much as to reduce its vitality.

6 The elasticity, flexibility and softness of bamboo blades do not require rubber tubing

for the blades, nor serration of the inner surfaces of the blades, nor curvature of the blades

NOTE

By LIEUT-COL. F. P. CONNOR, DSO, FRCS

A SPECIMEN of a bamboo clamp, which can be quite easily improvised in a few minutes, has been sent to us by Dr. Khurshed Husain, M.B., Ch.B. (Edm.), District Civil Surgeon, Raichur. This instrument was used, we are informed, for operating on a case of huge dilated stomach of 18 years' standing, due to pyloric stricture.

The idea is an ingenious one, and owing to the natural elasticity of bamboo, quite an efficient clamp can be made. The nature of the contrivance can be readily understood by studying the diagram (Fig. 2). Two separate pieces of bamboo, A and B, are split at one end X and Y, and when tied together at the knotted ends, C, in the groove provided, a three-bladed clamp is improvised. When the selected portion of stomach and bowel are introduced by separating the split ends at X and Y, the blades are clamped together by tying them at the notched ends, D, and anastomosis can be readily effected.

We have not had an opportunity of trying this instrument on an actual case, but feel sure that it would serve its purpose admirably.

EPITHELIOMA OF UPPER LIP IN A BOY 14 YEARS OF AGE

By L. P. STEPHEN, M.B., FRCS,
LIEUT-COLONEL, I.M.S.
Civil Surgeon, Karachi

THE history was that two years ago a tumour appeared on the right upper lip. It was removed by operation and a recurrence took place three months after.

The physical signs on admission to Karachi Civil Hospital, in February 1920, were as follows—

A tumour was present on the right upper lip, which extended beyond the middle line to the left and involved also the right angle of the mouth and a part of the lower lip. The tumour was hard with raised edges, ulcerating and fungating, covered with dirty wash leather slough and discharging sero-pus.

On the right cheek adjacent to the principal tumour were several secondary nodules, which were raised and warty in appearance, but were not ulcerating. The submaxillary and submental glands on both sides were enlarged and hard, but were not adherent to the jaw.

At the same time there was a tubercular spondylitis of the left fourth toe. The toe was amputated and the diagnosis confirmed.

A piece of the tumour of the lip was excised and sent to Parel laboratory for examination and the report was "A rare case of epithelioma of the lip."

The case appears worthy of record, owing to the rarity of epithelioma of the lip in so young a patient. Photographs of the case are attached

NOTES ON A CASE OF CYSTIC KIDNEY

By A. VISWALINGAM,

Acting Medical Officer, Kuala Langsar, Perak

A TAMIL male, aged 30 years, was admitted to the District Hospital, Kuala Langsar, on 14th April, 1919, for a swelling on the left side of the abdomen, with pain in that region and also on the left flank, and slight cough at night. He also gave a history of passing liquid stools with mucus. These symptoms were said to have existed for about a fortnight only. Later, however, the patient gave a history of having suffered from intermittent pain on the left side of the "stomach" since he was 10 years of age, but this did not disable him from work or cause any other inconvenience until a fortnight before his entry into hospital, when the pain was severe, and a lump was noticeable on the "stomach" region.

Abdomen inspection—A tumour was seen on the left side of the abdomen, filling its entire upper half. It extended to about two inches below the umbilicus, above, it was lost under the costal margin. Laterally it extended to the spine, filling the left flank.

Palpation—It was smooth and had rounded borders below, at the middle a notch could be made out.

Percussion—It was dull in its entire extent, the dullness extending to above the 6th intercostal space.

Deep fluctuation could be elicited. On exploration it was found to contain hæmo-serous fluid.

Operation—An exploratory laparotomy was performed. The incision was made through the left rectus. On opening the peritoneal cavity, a large cystic tumour (Fig. 1) was found to lie behind it and practically to fill the left side of the abdomen. The descending colon was found tightly stretched over the tumour, which was found to arise from the left kidney. The right kidney having been found to be healthy, the operation for the removal of the left organ was proceeded with.

The tumour was incised and 12 pints of clear fluid (measured) were evacuated. Owing to the friability of the tissues and the presence of several adhesions between the tumour wall and the surrounding organs, considerable difficulty was experienced in its removal. The kidney having been freed, the ureter and the vessels were separately clamped and ligatured at the hilus, and the kidney removed. The ureter was found dilated to such an extent that one's thumb easily slipped into it. Very little blood was lost, and there being no further oozing, no drainage was provided. The wound was closed in layers and a permanent dressing was applied. The patient was on the table for about one hour and 45 minutes and stood the operation well.

On 25th April, 1919, the stitches were removed, when the wound was found to be perfectly healed up (Fig. 2).

EPITHELIOMA OF UPPER LIP IN A BOY 14 YEARS OF AGE

BY LIEUT COL. L P STEPHEN, M.B., F.R.C.S., I.M.S.,

Civil Surgeon, Karachi



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Indian Medical Gazette.

JUNE

PROFESSIONAL MISCONDUCT

NATURE seeks to preserve the species at the expense of the individual,—medical practitioners ought to remember this, and not allow their actions to be influenced by competition. Competition may be the life of trade, but is most assuredly the death of any profession. Where competition is strong and medical ethics are weak, we shall find glaring instances of the desire to belittle a colleague with a view to acquire his patients. Such instances are, we regret to say, too common here in Calcutta. It was only the other day that a practitioner, who had been duly engaged to attend a lady, but was late, having been away from home when the summons came, on his arrival at the house found his way literally barred by another practitioner who had been called to attend to an emergency. The man claimed the case as his own! So far no united action has been taken against him which is a pity. A man who will thus act against a professional brother is not likely to have any scruples where his own interests as against those of his patients are concerned. What is required is a Medical Union, in order that such cases may be duly investigated and the guilty punished by ostracism, for the Medical Council does not concern itself with cases of this kind. Unfortunately the Medical Councils' decisions err on the side of leniency—mercy would be a misnomer—in cases of grave professional misconduct. Recently a practitioner was proved to have given a certificate as to the cause of death without examining the body. The autopsy showed that death was due to rupture of the spleen, and not to the cause guessed at by the practitioner. On his conduct being brought to the notice of a Council, he was censured. Apparently some members of that Council did not realise the gravity of his offence, or were not jealous of the honour of the profession. Had he been in practice in Britain it is certain that he would have had his name removed from the Medical Register and the fact would have been published in every newspaper. Here it has been argued that to publish the decisions of Medical Councils amounts to defamation! We know only too well how the hirelings of the Bar can,

and do, twist the words of any section of any Act to suit their clients, but we cannot conceive that any judge could be such an ass as to hold that a man who had by his peers been held to be guilty of infamous conduct in a professional respect, was defamed by the fact being made public. In the interests of the people it should be known who is trustworthy and who is not. *Salus populi suprema lex esto!*

Current Topics.

On the Effects of Injection of Quinine into the Tissues of Man and Animals

Jl of Hygiene 1919 Oct Vol 18 No 3
pp 317-336 With 1 plate—LEONARD S. DUDGEON

THE author who was Consulting Bacteriologist to the British Salonica Force, was requested to carry out an experimental enquiry on animals as to the effects produced by intra-muscular injections of strong solutions of quinine. Cast mules and horses, rabbits, guinea-pigs and frogs were used and the preparations of quinine were—(a) bi-hydrochloride in saline, (b) acid sulphate in saline (soon abandoned), (c) quinine alkaloid dissolved in alcohol, and (d) in ether. Those most commonly employed were (a) and bi-hydrochloride dissolved in brandy, the quinine solutions were injected in dilute as well as concentrated solution. Control observations were made on the action of acids and ether (quinine solvents) on the tissues of animals. Human muscle was examined from fatal cases of malaria or suspected malaria which had received an injection of quinine at periods varying from one hour to three months from the time of inoculation. The chemical estimations of residual quinine were undertaken by Captain Ferry, R.A.M.C., Analytical Chemist.

The conclusions reached were as follows—

(1) Concentrated preparations of quinine produce more intense necrosis than dilute but dilute preparations such as are of practical utility excite œdema and necrosis at the seat of inoculation. The difference between these two methods of quinine inoculation is not of sufficient value to justify active opposition to the method commonly employed.

Inoculation of quinine in solutions so dilute as to avoid œdema and tissue necrosis is not of practical utility in the human subject.

(2) A concentrated solution of quinine is absorbed rapidly from the tissues as shown by chemical analysis even in patients who are in *extremis*. It is not apparently stored as such in liver, kidneys or heart muscle.

(3) It is essential to realise that tissue necrosis—spreading œdema and local blood destruction are produced by the solvents employed for quinine administration, and the effects are only slightly inferior to those excited by quinine salts and the alkaloid.

(4) No advantage was obtained by the addition of olive oil or fat or by injecting the alkaloid dissolved in alcohol or ether whether in concentrated or in a dilute solution.

(5) Tissue necrosis occurs immediately and persists for a considerable period. In some instances the fibro-myositis which results is associated with a fibro-neuritis which causes various symptoms definitely related to the pathological processes.

(6) Necrosis of blood vessels in the area of inoculation is a common result. This leads to small hæmorrhages into the tissues, and has caused severe

(2) "a letter from Sir Leonard Rogers"—see above

"Now these two sets of observations [value of intravenous injections of hypertonic saline in cholera, failure of added gum arabic which proved of great value in cases of surgical shock] are by no means contradictory, but most beautifully complementary, also both are in consonance with the findings of the French school on anaphylaxis, and, as will be shown, with the earlier observations from India of Sutherland and McCay (*Biochem J* 1909, p 1) that hypertonic salines inhibit hæmolysis either in a natural hæmolytic system or an actively created one with a specific hæmolysin, as in the Bordet-Gengou reaction and the Wassermann test"

"The common cause of all these phenomena is a disturbance of that delicate equilibrium between the colloids of the blood and cells (such as proteins and lipoids) and the crystalloids (such as sodium-chloride) existing united or absorbed in common solution or suspension"

"Taking first, the positive effect of a colloid such as blood-proteins, gelatine, or gum acacia, in shock due to hæmorrhage, surgical injury or prolonged anaesthesia, as compared with the failure of simple hypertonic salines under these conditions, we find that the situation is one of a circulating fluid not merely defective in total volume but also relatively poor in colloid compared to crystalloid. Accordingly inorganic salts, or salines, given alone are here rapidly eliminated, having no colloid to anchor them, and so being treated as foreign bodies and thrown out by kidneys and intestine. But gum arabic, gelatine and plasma proteins cannot be so expelled, and serve to anchor inorganic salts and so preserve the equilibrium of crystalloid and colloid not only in blood—but in the master cells of brain and heart, where the state of aggregation of the protoplasm would soon become altered"

The author then refers to experiments showing interaction by changes of osmotic pressure when the concentrations of salines, in which the colloid is in solution, are varied—*Am J of Physiol*, 1902 and *Biochemical J*, 1906. The investigations referred to show—

(1) "That a solution of gum arabic made in water or saline, as recommended by Bavliss, and injected intravenously will at once seize upon or hold a certain amount of saline in the blood, and as a result of its presence the total salt content of the blood with which nerve and muscle cells stand in common equilibrium will rise, and (2) the most important fact that as a result of this absorption the state of aggregation of the injected gum will change so that the "molecular weight" or "solution aggregate" is only about one-third to one-fourth of its former value—for this is precisely what the fall in value of the osmotic pressure means on Avogadro's law"

"Take next the case of efficiency of hypertonic salines in cholera, and inefficiency of colloidal solutions such as gums, and it is clear that this is as it ought to be, for the condition is one of excess of toxic colloids and defect of balancing electrolytes or salines"

"On the other hand free saline in the blood in such diseases as cholera combines with toxins to form a crystallo-colloidal union, and this is an essential factor in excretion of the poison by intestine and kidney. The unattached colloidal molecule of toxin possesses no osmotic pressure, nothing to drive it through an excreting cell. When it becomes attached to a crystalloid the combination acquires a directive force like a gas molecule within a porous pot, and like this now possesses a power of diffusion"

The foregoing principles are next applied to the phenomena occurring in shock, the Bordet-Gengou reaction, the Wassermann test and in anaphylaxis, subjects not strictly relevant to this "Section". Then follow paragraphs of general interest, for an account of which space cannot here be found—*Tropical Diseases Bulletin*

Antimony Tartrate for Bilharziasis: A Specific Cure

Lancet 1919 June 14 pp 1021-1023—J
B CHRISTOPHERSON

ANTIMONY TARTRATE has been used as a routine treatment at the Khartoum Civil Hospital since May 1917, and the author now feels justified in maintaining that it is a specific cure, not only killing the adult Bilharzia worms but later also the embryos in the ova in the tissues, and thus eliminates the infected person as a carrier as well as curing him of the disease. In the present paper 30 additional cases are recorded in which the treatment has been satisfactory. The need of caution in the use of the drug is emphasised here as in the author's previous papers. The total amount of antimony tartrate necessary to effect a cure would appear to be less than 25 grs in all. Suspected relapses are due to the gradual elimination of dead ova. Eggs will not hatch after about 12 grs have been given although a marked improvement in the urine is noticeable even on the 5th day when only 3½ grs in all have been injected. Antimony is cumulative in the tissues [Details of treatment are given in previous papers, see *Bulletin* Vol 13, p 206]—*Tropical Diseases Bulletin*

A Case of *Trypanosoma rhodesiense* Infection which recovered

Lancet 1919 Nov 7 pp 829-830—C W
DANIELS and H B NEWMAN

THE patient was a young man of twenty years. He went to Nyasaland in September 1913, between that date and December 1914, he was frequently bitten by tsetse in various parts of North Eastern Rhodesia. In December 1914, he moved to the frontier of German East Africa where he remained until April, 1915. During this period he was constantly in fly-infested areas. In September 1915, shortly after returning to Fort Jameson, he began to get attacks of what he thought was malaria. Malaria parasites were found, but as quinine did not stop his fever a gland in his neck was punctured and trypanosomes were found.

Whilst in hospital in Rhodesia he had atoxyl, gr 3½, every third day, this continued until he landed in England in November 1915, and came under the care of Dr Daniels. Treatment at first consisted of atoxyl gr 3½ thrice weekly intramuscularly, with antiluetin gr ½ in solution once daily by the mouth. On December 8, 1915, injections of antimony oxide (Martindale) subcutaneously were begun, starting at first with a dose of 30 minims per diem and increasing this gradually until as much as 130 minims were given in 24 hours. The atoxyl and antiluetin were continued although owing to severe nausea it was found necessary to stop the latter drug from time to time. In March 1916, the characteristic circinate rash was first noticed, it lasted about a week, then gradually subsided. As trypanosomes still appeared in the blood from time to time it was decided to stop administration of antimony oxide and to try the effects of repeated intravenous injections of tartar emetic in doses of grs 2½ twice a week. The administration of atoxyl was also discontinued, but the antiluetin was continued. Tartar emetic injections were continued until April 1918. Trypanosomes were seen for the last time on April 6, 1916. Since cessation of treatment the patient has remained in good health. The authors write—

"The case is chiefly remarkable from being the first on record in which one may feel fairly confident that a definite cure has resulted in a true case of Rhodesian trypanosomiasis, and for the really enormous amount of tartar emetic it was found possible to administer. In all the patient had considerably over 500 grs of the drug, and no untoward effects of such administration have manifested themselves"—*Tropical Diseases Bulletin*

Modern Conceptions of Heart Disease

The Practitioner, March, 1920—W. EDGECOMB, M.D. M.R.C.P., I.R.C.S.

THE writer referring to the work of MacKenzie Lewis and others points out that the old conception of valvular disease and its after-effects was largely a mechanical one. While infection was recognised as the initial cause the after-effects were explained by interference with the normal course of blood through the heart leading to dilatation, hypertrophy, back pressure and general venous engorgement.

The modern conception places the valvular lesion after infection or poisoning of the heart muscle. If the conducting and contractile muscle fibres are intact and healthy the heart is able to maintain the circulation efficiently for all needs through a long and strenuous life in spite of permanent damage to the valve and the consequent regurgitation.

In support of this may be mentioned the following facts—

(1) The experimental production aseptically of a valve lesion causing regurgitation is not necessarily followed by enlargement or by any change in the muscle.

(2) Cases of frank valvular disease may be found post mortem to show no change in the muscle.

(3) The largest hearts found post mortem are frequently those in which there is no valve lesion discoverable, as in syphilis, renal disease, emphysema, adherent pericardium and alcoholism.

Apical systolic bruits—It follows that a systolic murmur at the apex may be discounted unless there is enlargement of the heart or a definite history of rheumatism. The loudness and character of the murmur, its conduction, give no help, for cardio-respiratory bruits may be equally well conducted through the axilla to the inter-scapular region.

Mitral disease—The writer prefers this term to mitral regurgitation or mitral stenosis which are merely different degrees of the same process. While the presence of a systolic bruit is no proof that mitral disease exists, a presystolic bruit is definite evidence that the valve is affected and usually connotes a more or less generalized carditis, with damage to the heart muscle especially the conducting paths.

Aortic disease—Similar remarks may be made about aortic disease. In aortic disease the risk of damage to the heart muscle is accentuated by the proximity of the coronary arteries. Hence the greater seriousness of aortic disease.

The foregoing facts are recapitulated as follows—

"In the diagnosis of organic disease of the heart—

1. A systolic bruit alone is of no value.

2. A systolic bruit with a permanent enlargement of the heart is definite evidence of

organic disease, but it is the enlargement that matters, not the bruit.

3. A diastolic bruit is definite evidence of an organic valve lesion, without a permanent enlargement, it is of relatively less import, with enlargement, there is definite evidence of carditis.

4. Enlargement, with or without a bruit, is definite evidence of organic disease."

Discussing the functional efficiency of the heart the writer proceeds—

"As the outcome of the foregoing considerations our outlook on valvular heart disease has undergone material change—from the prognostic point of view. No longer are we obsessed by the importance of murmurs when unaccompanied by other and more important physical signs. It has become recognised that the functional capacity of the heart to perform its appointed task is of more importance than the mere structural defects. If the exercise-reaction of the heart is good, the tolerance of sustained exercise equally good, and there is no enlargement of the heart, there is strong presumption that the muscle is undamaged, and systolic murmurs of whatever origin may safely be neglected as of little or no moment. If a diastolic bruit is present, either at the mitral or aortic area, there is certain evidence of structural organic disease, but here, again, if the exercise-reaction and tolerance are good, and there is no enlargement, a good prognosis may be given. More careful watching is required however, of the future progress of such cases, for there is more likelihood of muscle damage having taken place, or of slow chronic infection going on."

Rhythm of the heart—The chief forms of irregularity in rhythm and their separate significance are—

(1) *Sinus irregularity of the young*, in which the stimulus begins at the sino-auricular node and is probably a vagus effect. It is seen typically in respiratory arrhythmia.

(2) *Sino-auricular block*—A relatively uncommon form in which the stimulus arises at the sino-auricular node, but every now and then fails to materialise giving rise to a pause when the whole heart is at rest.

(3) *Extra-systoles*—The type of irregularity is extremely common and usually of little moment. The polygraph will in most cases show whether they are of auricular or ventricular origin, and an electro-cardiogram will determine their exact origin. They usually tend to disappear if the heart is accelerated by exercise or emotion to the inter-scapular region.

If extra-systoles only appear after exertion, they are of much serious import as they indicate some mechanical interference with contraction.

Extra systole may be present throughout life without impairing the efficiency of the heart.

(4) *Paroxysmal tachycardia*—This stimulus to contraction in this case arises in some ectopic

focus in the wall of the auricle. It is characterised by sudden onset, absence of variability in rate to changes of posture or to exercise, and equally sudden cessation after lasting a variable period of hours or days. The pulse is regular throughout.

Auricular flutter—The auricle in response to stimuli from an ectopic focus beats at a rate up to 300 beats per minute. The line between paroxysmal tachycardia and auricular flutter is fixed at 200 per minute. The ventricle is unable to respond to a rate of over 240-250 per minute. It is impossible to measure the rate of auricular contraction except by means of the electrocardiograph.

Auricular fibrillation—The common irregularity of the failing heart. The pulse is wholly irregular, no two beats being alike. The auricle instead of contracting as a chamber exhibits a tremulous flickering of bundles of fibres. Only some of the ectopic stimuli responsible for these contractions get through to the ventricle, hence the irregularity.

The diagnosis can be made clinically, a polygraph tracing will show the absence of the auricular wave, or a series of small waves due to the fibrillation.

The electrocardiogram will show the absence of the P wave due to the auricular contraction and its replacement by a number of small waves. Fibrillation once firmly established usually endures for the rest of life.

Ventricular fibrillation—This is a new conception of the terminal stage of heart failure. Sudden death may sometimes be due to ventricular fibrillation caused, for example, by sudden obliteration of a coronary artery.

Heart block—This is a well-known condition, due to disease of the conducting tissue of the heart, the condition may be inferred from a persistently abnormally slow pulse rate and the diagnosis made certain by means of the electrocardiograph or polygraph.

Pulses alternans—This condition is best recognised by taking a pulse tracing with an ordinary sphygmograph. It usually indicates a failing myocardium.

"Toe Rot."—A Rapid Method of Cure

Journal of the Royal Naval Medical Service
Vol V No 4 October, 1919—A O Ross,
M B, R N

A CONSIDERABLE NUMBER of officers and men who have served abroad, particularly on the China Station, return home with a distressing and chronic complaint, which is termed "toe rot" or gouty eczema. The condition always manifests itself in hot weather and may carry on in winter also. It consists in a necrosis and sloughing of the epidermis between the toes. The skin is most unhealthy, presenting a bleached pale lemon-yellow appearance and has a most disagreeable odour. In some cases fissures appear and these give rise to pain, but as a rule

the patient's chief complaint is the most abominable smell which meets him on removing his boots.

In destroyers one has a very limited choice of remedies, and as three of the four officers on board were applying for relief some potent remedy had to be devised. The Service "antiseptic paste" has an odour, but it is greatly to be preferred to the odour of necrosed skin, so a tube was served out to each of the victims with directions to apply it on alternate nights. The results were astonishingly good. The odour went, the skin ceased to peel off, the fissures healed. All this in ten days! Since then I have used this remedy many times with equally successful results, and I suggest it to all medical officers who are besieged by the victims of "toe rot."

Cardinal Cardiological Principles

WRITING under this heading in the *British Medical Journal*, November 15, 1919, Lewis gives the cardinal points to which attention should be directed in the daily examination of chronic affections of the heart as follows—

1 *The symptoms and signs of cardiac failure*—These are sub-divided into two categories—

(a) *The early evidences of an impaired circulation*—These are constituted by the symptoms which produce distress on exercise. The three chief are fatigue leading up to exhaustion, breathlessness, and pain. In all patients, whether the subjects of actual or supposed cardiac disease to know the tolerance of physical work is more than half the battle in arriving at a correct estimate of the case. A knowledge of the body's reaction to exercise in health, in ill-health and in the chief forms of heart disease is paramount. The writer does not mean the rise and fall of pulse rate or of blood pressure, they are of service, but those who measure the reaction in this way fail to appreciate the essential—the amount of work which produces distress. A man may have an exhaustive knowledge of electrocardiography, polygraphy, blood pressure percussion, the stethoscope, and what not, as a practitioner he is better without that knowledge if the first knowledge is lacking. It is of more consequence than the remaining cardinal points, for no patient who has a normal exercise tolerance has grave heart disease, and the gravity of the disease in a series of real heart cases is proportioned to the degree of distress produced by a given amount of work more nearly than it is to any other observable phenomenon.

(b) *The signs of cardiac failure of the congestive type*—These are cyanosis and engorgement as observed in the veins of the neck and in the liver. When present the exercise tolerance is never normal or near normal. The disease is then advanced.

2 *The signs of cardiac enlargement and its degree, without attempt to differentiate dilatation and hypertrophy*—Palpation ranks before inspection and percussion. The chief sign is the position and extent of the maximal thrust and the structures it involves.

3 *Signs of valvular disease*—Cardinally these comprise (a) signs of aortic regurgitation which are obtained reliably as often at the pulse as at the base of the heart, and (b) signs of mitral stenosis, of which but two are valuable—namely, a diastolic thrill in the apical region and a diastolic rumble of low pitch, audible over the maximal thrust and best heard often only heard, in the recumbent posture after the action of the heart has been accelerated by exercise.

4 *The presence or absence of fibrillation of the auricles*—If the heart is beating irregularly it should be ascertained whether fibrillation of the auricle is present or not. To obtain the last knowledge a few simple tests nearly always suffice.

(a) If there is constant quickening of the pulse during deep inspiration fibrillation is not present.

(b) If the heart beats at a rate of 120 or over, or can be induced by any means to beat at such rates while the pulse remains irregular fibrillation is almost certainly present. The faster the rate the more certain the diagnosis.

These tests are not exhaustive but they are sufficiently so for general practical purposes. The remaining disorders of cardiac rhythm either on account of their comparative rarity or because their significance in treatment is far smaller are not cardinal.

5 *Infection*—No examination is complete until the presence or absence of infection has been fully considered. The chief signs are—

(a) *Pallor*, especially when accompanied by sallowness or duskeness of the facies. This sign is of particular value in aortic disease. Pallor is then of ill omen.

(b) *Palpable enlargement of the spleen*, which is not a reliable sign of engorgement of the viscera, but is usually a sign of active infection of the valves in cardiac cases.

(c) *Petechiæ* in the conjunctivæ, mouth, or in skin round the base of the neck and shoulders. They are far more frequent than has been suspected until recently, and should be searched for repeatedly in all sallow cardiac patients.

(d) *Clubbing of the fingers*, which, when slight, is more frequently accompanied by infective endocarditis than by venous engorgement.

(e) *Fever*, constant or only at times.

(f) *A pulse rate constantly over 90 or 100 during rest while the pulse is regular*.

(g) *Gradual but steady loss of weight*.

(a) to (c) are more especially signs of infective endocarditis, a condition which in its sub-acute and chronic forms is much more widespread than is commonly believed, and terminates the lives of a goodly percentage of cases

of aortic regurgitation or mitral stenosis. Signs (f) and (g) are also yielded by intoxications.

6 *When evidence of disease is found, its etiology is to be taken into consideration*—It may be of rheumatic, syphilitic, or other infective origin, or it may result from senile changes. The etiology will control prognosis and treatment.

Instrumental examinations, he writes, are subsidiary methods, useful in checking or revising bedside tests but essential only in a few patients.

Dr Lewis lays great stress on exercise tolerance as a guide both to diagnosis and prognosis. If a patient takes exercise without undue discomfort has no cardiac enlargement, no aortic disease and no mitral stenosis, he can be told that his heart is sound. On the other hand where there is definite enlargement, aortic disease, or mitral stenosis, or fibrillation of the auricles, the safe course is to attribute any undue distress on exercise to a cardiac lesion. In young subjects, if there is no immediate evidence of heart disease a deficient exercise tolerance should rarely, if ever, be ascribed primarily to the heart. In elderly subjects more diffidence should be shown in the absence of signs of structural diseases as pain, breathlessness, or undue fatigue, and often the only signs of grave angina pectoris or myocardial degeneration.

As regards treatment the cardinal principle is to regulate the physical strains thrown on the organ. Work is good as long as it does not provoke undue breathlessness, fatigue or pain. Those acts which cause distress should be prohibited.

The indications for bed treatment are (1) distress caused by rising to the feet or by walking leisurely, (2) active infection, (3) the necessity of drastic treatment by a drug such as digitalis.

The chief value of digitalis lies in its power to control the ventricular rate in fibrillation of the auricles. To the heart digitalis is not a cardiac stimulant but a powerful hypnotic. It prolongs the diastolic periods, during which the heart sleeps.

Ionization

The Practitioner—By MARK WARDLE, L.R.C.P. & S., V.D., Hon Surgeon, Bishop Auckland Cottage Hospital, etc.

HAVING worked at this method of treatment throughout the last year, I have found two outstanding results—(a) its wide range of usefulness, (b) its certainty.

In treating cases with ions, some important points must be kept in mind, viz—

Correct polarity,
Accurate contact of the electrodes,
Protection of any tender surface by coating with a non-conductor (collodion, for instance)

In treating an area one need not worry about having contact with every portion of it, seeing that ions travel quite a considerable distance beyond the point of contact, for instance, the whole of the surfaces of such a large joint as the knee can be freely "douched" with ions driven from a pad placed over the knee—but much care must be exercised in the protection of delicate parts of the skin, or there will result burns that will take something like two months to heal.

I append notes of some cases, chosen as being the worst of their particular kind, and on account of their diversity of character.

1 *Chronic gouty arthritis of knee*—The slightest movement caused severe pain. X-ray photo showed osteophytes at several points, and considerable denudation of patellar cartilage. *Treatment*—Two per cent solution of potass iodid in pad placed over knee. 50 M A, 30 min alternate days. After first application pain almost gone. After second, patient walked for an hour in comfort. Regular application for four weeks, occasional afterwards. X-ray photo three months after, no osteophytes visible, use of limb normal.

2 *Chronic ulcerative keratitis*—Entire eye-ball inflamed, sight almost nil. Several months' treatment by numerous methods resulted in no improvement, and excision to save the good eye seemed the only thing left. Zinc ions by pad over closed eye. 5 M A, 10 min alternate days. After first application improvement commenced. After seventh, ulcers all healed, no opacity, the rest of eye-ball free from inflammation and sight normal.

3 *Polypoid growth*, with extensive granulations involving anterior portion of tympanic membrane and adjacent parts, free discharge of foetid pus, could hear only sharp loud sounds. Zinc ions, 8 M A, 10 min alternate days. Symptoms steadily improved, treatment continued for 20 applications (seven weeks). All growths gone, no discharge. Three months later no return of symptoms, can hear watch.

4 *Chronic rhinitis*—Much foetor and discharge. Zinc ions, 10 M A, 10 min alternate days. Continued for 20 applications. Two months later condition normal.

5 *Spinal curvature dorso-lumbar*—Of many years' standing (tuberculous?). Patient could only move about the room by holding to furniture, and suffered much pain. Iodine ions (sol potass iodid), 50 M A, 30 min alternate days—Pain relieved after first application, gradually disappeared. After twentieth, walks without help and gets up and down stairs.

6 *Carbuncle*—Had reached stage of frequent attacks of severe pain, slough firmly adherent. Zinc ions, 15 M A, 30 min. One application, pain ceased during application. Twelve hours later slough came away adhering to dressing.

7 *Ophthalmia neonatorum*—Baby fourteen days old. Lids of both eyes bulging and inflamed, pus welling out. Zinc ions, 3 M A, 3 min. After first application, eyelids normal, slight amount of pus. After second application, left eye normal, slight indication of pus in right, child can open its eyes freely. No sign of corneal injury.

8 *Sinus after mammary abscess (tubercle)*—Foul discharge. No improvement under various treatment. Running irregular, temperature up to 102. General and pulmonary condition getting steadily worse. Sinus slit up. Zinc ions, 20 M A, 30 min. After first application discharge slight. No foetor. Subsequent improvement steady, temperature normal. Second application given a fortnight later. General and pulmonary condition, a month later much improved.

9 *Inoperable cancer of rectum*—I have already reported this case in the *B M J* (Oct 18). There is now (November 20) only a slight band of malignant growth at the anus, and I am confidently awaiting the termination of the case to prove that we have in zinc ions an efficient agent for the "cure of cancer."

Ionic Medication in Cancer

The Medical Review Vol XXIII No. 1
January, 1920

"M. WARDLL (*British Medical Journal*, Oct 18, p 495) has treated a considerable number of cases of varied character by ionic medication. Impressed by the results, especially by the rapid destruction of carbuncles, he used it in an inoperable case of cancer of the rectum.

A man, aged 74, was admitted to the Auckland Poor Law Infirmary with cancer of the rectum. His age, his bad general condition, and the area affected, negatived any attempt at surgical treatment. The rectum, as high as the finger could reach, was filled by a hard mass, the perineum and the soft parts around the anus, extending laterally to the ischia and behind to the coccyx, were involved and indurated. There were a number of raised points commencing to suppurate, and he suffered from the usual typical attacks of severe pain. Having found that the excruciating pain of carbuncles is removed by one application of zinc ions, and influenced by the favourable effect of copper ions on lupus, the writer tried treatment by copper ions in the hope of at least relieving the pain without opium. The first application was made on July 8, and from that day until the twenty-fourth dose he was much relieved of pain, but in other respects remained in *statu quo*.

Zinc ions were then tried and after one application pain ceased. On October 6, after 17 applications his condition was as follows—The anus presented a ring of hard growth, the rectum as far as could be reached, was soft and normal. All the induration of the perineum and surrounding area had disappeared and only one suppurating point—the largest—remained, but was much reduced in size. The old man was able to get up and walk about, and felt "quite well." His general condition was much improved.

The method adopted was as follows—The rectum was packed with a tampon of wool soaked in a 2 per cent solution of zinc sulphate, the depressions around the anus were packed so as to make the whole surface level, and a pad of 16 layers of lint applied, covering all the diseased structures with sufficient pressure to ensure accurate and equal contact throughout. The active electrode (positive) was attached to the pad, and the indifferent (negative) to the lumbar region. The current employed was 60 milliamperes for 30 minutes on alternate days.

This case proves that zinc ions relieve pain, and not only check malignant growth, but destroy it."

Inequality of the Pupils in early Syphilis

The Medical Press and Circular January 21, 1920

"INEQUALITY of the pupils without the Argyll-Robertson sign may be observed in all

stages of syphilis. The periods of its occurrence are variable in the course of the infection. The earliest time is during the fourth week from the onset of the primary sore, then later during the secondary stage, and later still in the tertiary. Adamson (*British Journal of Dermatology and Syphilis*, Vol XXXI Nos 10-12) quotes S. Nicolau to the effect that this inequality of the pupils is often permanent, but that the persistency of the sign should not be regarded as definitely constituting a menace to the patient's future. Nevertheless inasmuch as the lesion probably indicates some involvement of the nervous system, it is one that should be carefully watched, while it is advisable not to lose sight of patients who have early inequality of the pupils. Diagnostically it is also a valuable sign in cases of latent or doubtful syphilis. Early inequality of the pupils may co-exist with early lymphocytosis of the cerebro-spinal fluid, not only in the secondary period, but in the primary stage."

The Effects of Multiple Embolism of Pulmonary Arterioles

Quarterly Journal of Medicine, Vol XIII No 50 January, 1920—J. S. DUNN

THE intention of the research outlined in this paper was to determine the effects on the circulation and respiration of mechanical blockage of the pulmonary arterioles. It is known that pulmonary irritant gases at a very early stage cause thrombosis of the capillary blood-vessels in the lungs, but it is uncertain to what extent the restriction of the pulmonary circulation thus brought about is responsible for the symptoms.

The animals used were chiefly goats and the substance employed to produce embolism was an emulsion of freshly prepared potato starch. This had the great advantage of not passing into the systemic circulation.

The starch emulsion was introduced into the jugular vein or into the right ventricle.

The results of the experiments are best described in the author's own words:

The methods adopted in this research are believed to provide, at first, an uncomplicated condition of multiple embolism of pulmonary arterioles. There is no reason to believe that any of the results which have been observed are due to lodgement of emboli in other organs than the lungs. In this respect these results may differ from those produced by experimental oil-embolism in animals, or from the phenomena of fat-embolism in the human subject. In the later conditions a considerable amount of the embolic material passes through the pulmonary capillaries, and, entering the systemic circulation, may cause lesions in the brain and elsewhere.

Where a large dose of starch emboli causes sudden death it apparently acts in a very direct fashion. The arterial blood-pressure falls almost at once to a fatal level, and the pressure in

the large veins rises simultaneously almost to the same figure, so that the circulation is brought to a standstill. It appears as if the passage of blood from the right to the left side of the heart were almost completely cut off in the lungs. There is also no doubt, from histological examination of the lungs in these animals, that the degree of obstruction of the pulmonary arterioles is very great.

Where the dose of starch is sufficient to cause sudden death, the blood-pressure in the right heart and great veins shows at most a transient rise immediately after the injection. Afterwards the venous pressure has been observed to remain at normal level for more than three hours in unanæsthetized goats, although during that time the animals showed symptoms of acute illness. The arterial blood-pressure, which has been recorded only in animals which were under the influence of a general anæsthetic, has remained at or above the normal level for an hour after similar doses. This maintenance of pressure during the first hour is of more significance than the subsequent fall for there is no doubt that the anæsthetized animals die sooner after embolism than the unanæsthetized. From other experiments it would appear that there is no great permanent diminution in the amount of blood which passes through the lungs per minute with this order of dosage.

The maintenance of the arterial pressure and of the blood-flow in these experiments is all the more remarkable when it is considered that the vessels which are blocked are mainly arterioles and not capillaries. Whereas for any single occluded capillary the alternate routes are practically infinite, an arteriole is an end artery on a small scale, and represents a definite division of the main pulmonary artery, so that its whole function cannot be adequately taken over by any other vessel. In these facts we have definite evidence of a *very considerable reserve of vascular area in the lungs*. We know that a large number of pulmonary arterioles can be occluded and yet leave the circulation substantially maintained, at any rate for the resting animal. Therefore, more blood must pass through the unobstructed arterioles than they are normally called upon to accommodate. Theoretically this result might be attained in any one of three ways: (1) by diminution in the viscosity of the blood, (2) by increase of pressure in the pulmonary artery, and (3) by dilatation of the unobstructed vessels. It has been shown by estimation of the hæmoglobin that there is no diminution of the concentration of the blood and therefore of viscosity, and direct measurement has shown no lasting rise of systolic pressure in the right ventricle, so we are driven to the third conclusion that the pulmonary arterioles are dilated to provide compensation. In other words we have indirect evidence that *the amount of blood which passes through the pulmonary arterioles is subject to regulation apart from that*

which is obtained by alterations in the pressure of the blood in the pulmonary artery

From the above considerations it would appear that the blockage of capillaries by thrombi in gas poisoning does not by itself constitute a serious obstruction to the circulation. In that condition, however, it is associated with other factors, such as pressure of alveolar fluid on the capillary walls, increase in the viscosity of the blood, and possible alterations in the texture of the endothelium in non-obstructed capillaries, and in the production of the total deleterious effect it may have a substantial share.

The peculiar form of dyspnoea caused by embolism is of special interest in that it appears to be determined by nervous influence. It follows almost immediately on introduction of the obstructive material, and the degree of its development may be quite disproportionate to the dose of emboli injected. The form of the dyspnoea is similar to that which rapidly followed inhalation of pulmonary irritants, and the two are in so far analogous that they are fully established before there is any production of œdema or other visible organic change in the lungs, and certainly long before there is any mechanical interference with the ventilation of the alveoli.

When death results from the less severe doses of emboli it is found that the primary obstruction of vessels has become complicated by secondary pathological changes in the lungs. These may also be observed in process of development in animals killed at intermediate periods. They comprise pulmonary œdema mainly interstitial, but in part alveolar, and spastic contraction of the atria and infundibula. The addition of these to the vascular blockage probably determines the late desaturation of oxygen in the arterial blood and ultimately the death of the animal.

The pulmonary spasm produced by embolism resembles in general that which is occasionally observed in gas poisoning, but differs in its time of incidence. In gas poisoning it is an early phenomenon, and it may, though rarely, be so complete and effective as to cause death within fifteen minutes of exposure to gas. The spasm of embolism has not been observed less than an hour after the start of the experiment, and even then it sets in gradually and only attains a maximum when death is imminent. The significance of this change is uncertain.

The Pathology of "Influenzal Pneumonia"

Boston Medical and Surgical Journal—F. P. McNAMARA, M.D.

THIS paper is based on the results of 95 post-mortem examinations performed at the Brady Laboratory of Pathology at the New Haven Hospital, Connecticut.

The writer, briefly referring to the etiology of influenza, states that while we do not know

the cause of influenza, there is a general consensus of opinion that it is not primarily due to the influenza bacillus. The most promising work is that of English and French investigators who have found a filterable virus in the blood of influenza patients, which when injected into monkeys produces a hæmorrhagic condition of the lungs.

The features noted on external examination of the body were plum colouration of the face, neck and upper extremities, frothy, blood-tinged fluid bubbling from the nose and mouth, jaundice due to increased destruction of red blood cells and cloudy swelling of the liver, and lastly intense rigor mortis.

On opening the thoracic cavity a slight excess of blood-tinged serous fluid was usually seen. There was sometimes fibrin but rarely purulent fluid.

The trachea and larynx were of a deep red colour and frequently showed punctate hæmorrhages. Superficial ulceration was common. An exudate of clear or faintly blood-tinged mucus with some fibrin was often seen.

The lesions in the bronchi and bronchioles are more intense and vary with the duration of the disease. In the early cases the lumen contains serum and mucus, the submucosa is congested and œdematous, while the epithelial cells are more granular than usual. More advanced cases show hyaline necrosis of the epithelium which may be absent in places, barring blood-vessels and leading to hæmorrhage. Bacteria, red-blood cells and cellular debris are abundant. The necrotizing process may extend through the wall of the tube and lead to peribronchial pneumonia or actual abscess formation. When repair takes place contraction of the fibrous tissue may lead to obliterating bronchiolitis and bronchiectatic cavities. Owing to the number of actively dividing young epithelial cells the histological picture is like that of carcinoma.

The writer divides the lungs into three groups. The first, an acute fulminating type characterized by intense congestion, a tendency to hæmorrhage into the lung, an aplastic serous or sero-fibrinous exudate in which bacteria abound, and hyaline necrosis, slight or great in extent, of the terminal bronchioles, and of the alveolar walls. Interstitial emphysema results from rupture of the latter structures.

In the second type the process tends to become localised, necrosis is marked. The lung retains its increased volume, but the consolidation is more liable to involve the lower portions of the lungs. In general the distribution is lobular. On section the most outstanding feature is thick pus welling from all the bronchial tubes.

The latter are dilated. The consolidation is patchy. Small and large abscesses may be seen, actual gangrene is sometimes encountered.

The third type includes those cases which survive a considerably longer time. Organization of the bronchiolar and alveolar exudate is

the prominent feature. Unlike lobar pneumonia this led to obliterating bronchiolitis and the formation of bronchiectatic cavities, as well as large areas where the alveoli were filled with granulation tissue.

The extra pulmonary lesions most commonly found were dilatation of the right heart, acute splenic tumour, cloudy swelling of the viscera, hemorrhages in the adrenal bodies in the rectus muscles.

The organisms found were pneumococci, streptococci, the "influenza" bacillus, staphylococcus aureus, bacillus pneumoniae and micrococcus catarrhalis.

The pathology may be briefly summed up as follows —

"We have a disease of unknown origin but one which undoubtedly affects the upper respiratory tract and which may be primary in the lung itself. Acute laryngitis and tracheo-bronchitis result. Because of the injured trachea the mouth organisms gain access to the lung perhaps already injured and there set up a diffuse pneumonia. The latter is characterized at first by oedema, congestion, hemorrhage and hyaline necrosis of the bronchiolar and alveolar walls. Later the process tends to localize the necrosis of the lung, varying in degree from milium abscesses to actual gangrene results. If the patient survives, organization of the interstitial bronchiolar and alveolar exudates results in fibrosis of the lung, obliterating bronchiolitis and in the formation of bronchiectatic cavities. The bronchiolar epithelium proliferates in this disease as in no other and has the histological characteristic of an epithelial neoplasm."

The Technique of Citrated Blood Transfusion

The Boston Medical and Surgical Journal, Feb., 1920—MAJOR H. C. MARBLE, M.D., M.C. (U.S.A.)

THE writer states that "the transfusion of citrated blood now seems to have taken a very definite place in the surgical world. Its advantages over other methods are numerous, its therapeutic results are identical and when carried out with careful, painstaking technique it is safe, accurate, and sure. Thousands of these transfusions were carried out in the A.E.F. with remarkably good results."

The following points must be borne in mind in performing citrated blood transfusions —

- "(a) The recipient must be carefully typed
- "(b) The donor must be carefully typed and if time permits a Wassermann reaction done
- "(c) Only donors of the same or higher types than the recipient shall be used

"(d) Blood is a fragile tissue; the processes of coagulation begin almost instantly when the blood leaves the vein; therefore, the blood must pass quickly, easily and cleanly into the sodium citrate solution and be immediately mixed with it before coagulation begins.

"(e) Having obtained the blood and having carefully mixed it with sodium citrate, the process of administering it to the recipient may be carried out much more leisurely than in other methods, the problem of coagulation having been eliminated."

If known types are not available the following method of determining compatibility may be used —

"Draw the blood from the recipient as for a Wassermann reaction. Allow to clot and the serum to separate. Pipette off the serum and centrifuge until clear. Add normal sodium citrate solution (3.8 per cent) in the proportion of one part to ten parts serum.

"Use this as a type serum. Mix it with blood from donors as before, rejecting those that agglutinate."

Drawing of blood—The apparatus required is as follows —

A graduated 1000 c.c. flask drawn out at one end to fit a short rubber tube about 2 inches in length.

A short clean needle, 14 to 16 gauge.

A long glass stirring rod.

Procedure—The usual procedure for puncturing veins is adopted. The needle may be introduced directly into the distended vein (Median basilic) or through a small transverse incision. 50 c.c.m. of freshly made sterile isotonic sodium citrate solution (3.8 per cent) is introduced into the apparatus before puncture. The blood is allowed to rise in the flask while an assistant stirs the citrate solution in.

50 c.c.m. of the citrate solution is sufficient for 500 c.c. of blood. If more or less blood is required the amount must be increased or decreased in proportion.

Introduction of blood—The same flask filled with the citrated blood is used. This is attached to a 19 or 20 gauge needle by a rubber connecting tube 3 feet long with a glass window near the distal end. The blood is allowed to flow in by gravity. It is a good practice to stop after 30 c.c.m. have been introduced to note possible symptoms of hæmolysis. These are —

(a) Shortness of breath, (b) intense flushing of the face sometimes with urticaria, (c) pain in abdomen or back, (d) vomiting. According to the writer, hæmolytic reactions are rare. Slight chills occurred in a small percentage of the cases.

The advantages of the citrate method are summarized as follows —

"(a) The whole apparatus may be sterilized by boiling and may be used repeatedly. I have performed four transfers of blood in one afternoon with a single apparatus. Following each transfer the apparatus was washed in cold water and re-boiled. No further preparation is required.

"(b) In drawing the blood if there is clotting in the needle, a new one may be substituted without losing or harming the blood already drawn.

"(c) Citrated blood will keep several hours if necessary

"(d) The blood may be drawn in the operating room, carried to the ward in the flask and there introduced into the patient

"(e) The therapeutic results as compared with other methods of transfusion are identical

"(f) The whole operation may be done easily, surely, and without haste

"(g) The blood may be administered through a very small needle without incision, which is of value in hemorrhagic patients who often bleed from the wound"

Further Studies on the Use of Water-Soluble B in the Treatment of Infant Malnutrition

From the Society of the New York Hospital, New York—By WALTER H. EDDY

RESULTS of experiments were reported confirming previous work of the author in stimulating growth by the addition of B vitamin extract to the diet of infants suffering from malnutrition of the marasmus type. A new feature used in the study was the application of the Bachmann test to measurement of dosage.

In experiments with vitamin prepared from the navy bean by the McCollum method, the test detected relatively small amounts of vitamin and while in need of further standardization offered a valuable aid in measurement of the vitamin B present in the substances used. Tables were shown giving the result of the test on various amounts of the dextrin-vitamin mixture and on other substances such as milk, both cow and human milk.

The first case, showing stimulation with the B vitamin gained an average of 0.84 ounce per day in a 32-day period as against a gain of 0.47 ounce per day during 17-day period preceding the use of the vitamin through the calorie intake and the food given remained constant through both periods. The second case showed a similar stimulation though not so well controlled as the first. The interesting feature of the use of the Bachmann test as applied to the first case was the result of the tests as applied to the child's diet and to the extract. The diet was found to contain 2,120 units of vitamin and the stimulating mixture only 70 units. In other words, an increase of only 3 per cent in actual vitamin intake produced the marked stimulation. The author suggested that this result may be due to the fact that the child could utilize the vitamin in the diet and that the way the vitamin is held in a diet may be an important factor. In all the baby cases treated the extract feeding is followed by an increased growth, which continued to a point where removal of the extract is possible without marked reduction in the growth rate, and the child then goes on to recovery.

These cases represent the fifteenth and sixteenth showing stimulation under this treatment—*The Journal of Biological Chemistry* Vol. XLI No. 3

Preliminary Observations on the Relation of Bacteria to Experimental Scurvy in Guinea-pigs

From the Research Laboratories, Western Pennsylvania Hospital, Pittsburgh—By MAURICE H. GIVENS and GEORGE L. HOFFMAN

Whether or not bacteria play any rôle in the development of scurvy in guinea-pigs has not been settled by direct evidence. Jackson and Moore found coccus-like bodies in microscopic sections of lesions in scorbutic guinea-pigs. Jackson and Moody isolated from the diseased joints, muscles, and lymph glands of these animals gram-positive and gram-negative organisms. Pure strains of these bacteria introduced into guinea-pigs gave rise in most instances to hemorrhagic and other lesions in the bones, joints, muscles, lymph glands, and organs. Torrey and Hess concluded that scurvy, both of guinea-pigs and of infants, was not associated with an overgrowth of putrefactive bacteria in the intestinal tract.

We have attempted to throw further light upon the question by bacteriological examinations of the blood, joints and feces of guinea-pigs made scorbutic on different diets and then treated with different antiscorbutic foods. Blood from scorbutic animals anesthetized and from those dying of the disease regardless of the diet producing the same has been found to be sterile. The enlarged front joints of guinea-pigs developing scurvy on oats alone were sterile, this was likewise true in the majority of cases of guinea-pigs developing scurvy on the soy cake food of Givens and Cohen. However, in two or three instances a staphylococcus and diplococcus were isolated. Pure strains of these organisms injected intracardially, intraperitoneally, and into the joints of healthy guinea-pigs on a mixed diet produced no signs of scurvy. Smears and cultures were made of material from different parts of the intestinal tract of guinea-pigs on oats alone, on oats plus lemon juice, 3 c.c. daily, after scurvy developed, on the soy cake diet, and on the same plus cabbage after the appearance of scurvy. No marked difference was found in the intestinal flora under any of these conditions—*The Journal of Biological Chemistry* Vol. XLI No. 3

The Rôle of Fat-Soluble Vitamin in Human Nutrition and its Suggested Relation to Rickets

From the Bureau of Laboratories, Department of Health, New York—By ALFRED F. HESS

It has been shown that the fat-soluble vitamin is an essential constituent of the dietary

of rats. There have also been clinical reports attributing marked malnutrition in infants and children to a lack of this dietary factor (Japan, Denmark). As a result of these experiences it has been accepted that this vitamin is highly important for man, and that the lack of it leads to nutritional disorder in children. This has been emphasized all the more as this vitamin is not nearly so widely distributed in nature as is the water-soluble vitamin. In order to study this question five infants varying in age from 5 to 12 months, were given a diet which was complete except for a very small amount of fat-soluble vitamin. It consisted of 180 gm daily of highly skimmed milk ("Krystalak" 0.2 per cent fat), 30 gm of cane sugar, 15 to 30 gm of autolysed yeast (to supply water-soluble vitamin), 15 cc of orange juice, 30 gm of cotton-seed oil, and cereal for the older infants.

On this diet the children have done well for a period of 8 to 9 months. They have shown no anemia, no eye trouble, no bone changes, as seen by the X-ray, nor has their growth in length or in weight suffered. We believe, therefore, that either a very small amount of this vitamin suffices to supply the needs of human nutrition, or that this deficiency has to be maintained for a period of years in order to bring about any harmful result. Danger from a lack of this dietary factor need not be apprehended if the diet is otherwise complete.

The development of rickets has been attributed by Mellanby, as a result of experiments on dogs, to a lack of fat-soluble vitamin and Hopkins and Chick have termed this vitamin the "anti-rachitic factor." It was found, however, that infants fed on this "fat-soluble vitamin minimal diet" did not develop the well-established signs of rickets—beading of the ribs, enlargement of the epiphyses, the weakness of the muscles, etc. We cannot believe, therefore, that rickets is brought about merely by a deficiency of this principle, all the more so, as this disorder developed in infants receiving large quantities of milk containing ample fat-soluble vitamin. It may be added that neither cream nor the leafy vegetables, both of which are rich in this principle, are comparable to cod liver oil as growth stimulants.—*The Journal of Biological Chemistry* Vol XLI No 3

The Etiology of Rickets

From the Laboratory of Chemical Hygiene, School of Hygiene and Public Health, the Johns Hopkins University, Baltimore—By E. V. McCOLLUM, NINA SIMONDS and HELEN T. PARSONS

"WE have conducted an extensive series of experiments with rats restricted to diets derived from cereals and legume seeds, cereals, legume seeds, and muscle meats, and with similar diets in which degerminated products of cereal

grains replaced whole seeds, and have supplemented these mixtures with purified food substances to determine the nature and extent of their dietary shortcomings.

In these experiments we have observed the gross picture of rickets in many of the animals restricted to faulty diets, and have demonstrated that this condition develops on diets in which the faults lie in several different factors.

A low content of fat-soluble A, low calcium content, poor quality of protein, and unsatisfactory salt combinations, acting in combinations, may all contribute to the etiology of the disease. We have not yet completed our observations on diets in which but a single factor is at fault. It is certain that specific fasting for fat-soluble A cannot be regarded as the sole and only possible cause of rickets.

Since the same gross picture can be induced in several different ways, we are led to suggest the possible occurrence of more than one kind of rickets. Histological studies of tissues of animals suffering from what appears to be rickets, but from different causes, are still in progress. No decision can yet be reached as to whether in all cases the histological picture is the same in animals exhibiting beaded ribs, enlargements of the costochondral junctions, deformity of the thorax, and general deformity of the body, irrespective of the dietary factor or factors which brought about the condition.—*The Journal of Biological Chemistry* Vol XLI No 3

"The Control of Hæmorrhage by Intramuscular Injection of Calcium Chloride.

Guy's Hospital Gazette, p 159—W. R. GROVE

THE value of the salts of lime in increasing the coagulability of the blood is well known, but it is not so well known that their absorption from the intestine is very slow and minute. Professor Dixon pointed this out, saying that practically all the salt could be recovered from the fæces, and he suggested its hypodermic use in a dose of one grain. In a troublesome case of hæmoptysis the writer gave in the forearm a grain of calcium chloride diluted with 20 minims of water. The result was immediate and perfect, but a patch of gangrene of the size of a sixpence developed at the site of injection, which sloughed away and gradually healed. The patient, rid of his hæmoptysis, thought the scar a small price to pay.

The writer has always at hand a 1 in 4 solution of the fused calcium chloride. In hard water there is a precipitate, but this is shaken up and 4 minims of cloudy fluid are drawn into the syringe and boiled hot water is drawn up afterwards to the 20-minim mark. This is injected deeply into the gluteal muscles. The injection is painless.

In hæmoptysis the injection always acts like a charm, and so certain is the result that when pressed for time the writer assures the friends that the bleeding will stop and tells them not

to expect to see him for two days, unless they send. In all cases of hæmorrhage when it is impossible to reach the bleeding spot the injection is invaluable. In hæmatemesis it has acted in the same way. In certain cases of metorrhagia it has been useful, and good results have been obtained after the oral administration has had no effect. After abdominal hysterectomy in an extremely fat woman there were signs of peritoneal hæmorrhage with collapse, distension, and oozing from the incision, and presumably a ligature had slipped. The surgeon could not easily be got at, but after an injection of calcium chloride all the symptoms gradually subsided, and she recovered without the wound having to be opened up. In a case of aortic aneurysm two injections were given, at about a fortnight's interval. The patient is apparently getting better since the bruit has almost disappeared and the dulness is decreasing. In many other cases the method may prove useful, *e.g.*, when the diagnosis of a ruptured extra-uterine pregnancy is made in the anxious time before operation, in typhoid hæmorrhage, in anticipating secondary hæmorrhages, in war work, and as a preparation for certain operations. The writer always keeps a small bottle in his emergency and midwifery bags.

One warning—once one of the writer's house-surgeons, out of his imperfect memory, injected 10 grains instead of one, producing a terrible femoral thrombosis and gangrene. But with one grain as the dose no harm has resulted."

VICTOR PAUCHET, in the *American Journal of Surgery*, 1920, 34, 1, notes that spinal anæsthesia improves the prognosis in cases of intestinal obstruction, since it causes intestinal contraction, releases the abdominal wall, and does not cause vomiting. In his opinion, it should *not* be employed in cases for which local anæsthesia is sufficient—varicocele, hæmorrhoids, perineorrhaphy, prostatectomy, goitre, cancer of the tongue, osteotomy of the femur and amputation of the foot, etc., being reserved for major operations. He believes that plugging the patient's ears and blind-folding him are useful preliminaries, joined with the injection of scopolamin-morphine and a cardiac stimulant one hour before the operation. If the tension be low 10 c.c. of fluid may be withdrawn, if it be high 25 to 30 c.c. should be taken—the first few drops being allowed to flow into the ampoule containing the anæsthetic powder. The dose of anæsthetic required varies with the operation, the quantities being in the ascending scale for foot, thigh, arm, uterus, ulcers, stomach, kidney, liver, from one-third to a whole ampoule corbière, which contains 0.6 gr. procaine with 0.3 gr. cocaine.

3 c.c. of the prepared solution are injected, then the cerebrospinal fluid is again aspirated and again injected and so on to ensure thorough diffusion, which is aided by making the patient

cough. The injection should be made slowly—and should take several minutes. First the skin and then the underlying tissues down to the vertebral column are infiltrated with 1/200 solution of procaine—when this is done a large needle may be used for the spinal puncture without causing any pain. The seats of puncture are in the middle line (a) between the 12th dorsal and 1st lumbar vertebræ—the spot being on a line uniting the lower borders of the 12th ribs, (b) between the 2nd and 3rd lumbar vertebræ, and (c) between the 5th lumbar vertebra and the sacrum—this is the largest space, and there is no chance of wounding nerve tissue if the needle be thrust in the middle line.

In hysterectomy for uterine cancer, as the operation is likely to last a long time, the abdominal wall should also be anæsthetised by infiltration of an area of the width of the thumb from the umbilicus to the pubes. For this a 1 per cent solution of the hydrochloride of quinine and urea is used, and has the advantage of causing loss of sensation of the part which lasts several days, thus adding to the patient's comfort after operation. The skin cicatrix will be indurated for a long time, but this does not matter—and can be bettered by the patient massaging the part with her fingers later.

In Pauchet's opinion, surgeons who prefer general anæsthesia to spinal anæsthesia for Wertheim's operation are wrong: the dangers are the same, but the operation is easier under spinal anæsthesia because the abdominal wall is well released, the abdomen is quiet, and the patient does not push out her intestines by straining. In cases of uterine cancer the mortality is lower with spinal anæsthesia because the operation can be done more easily and more thoroughly.

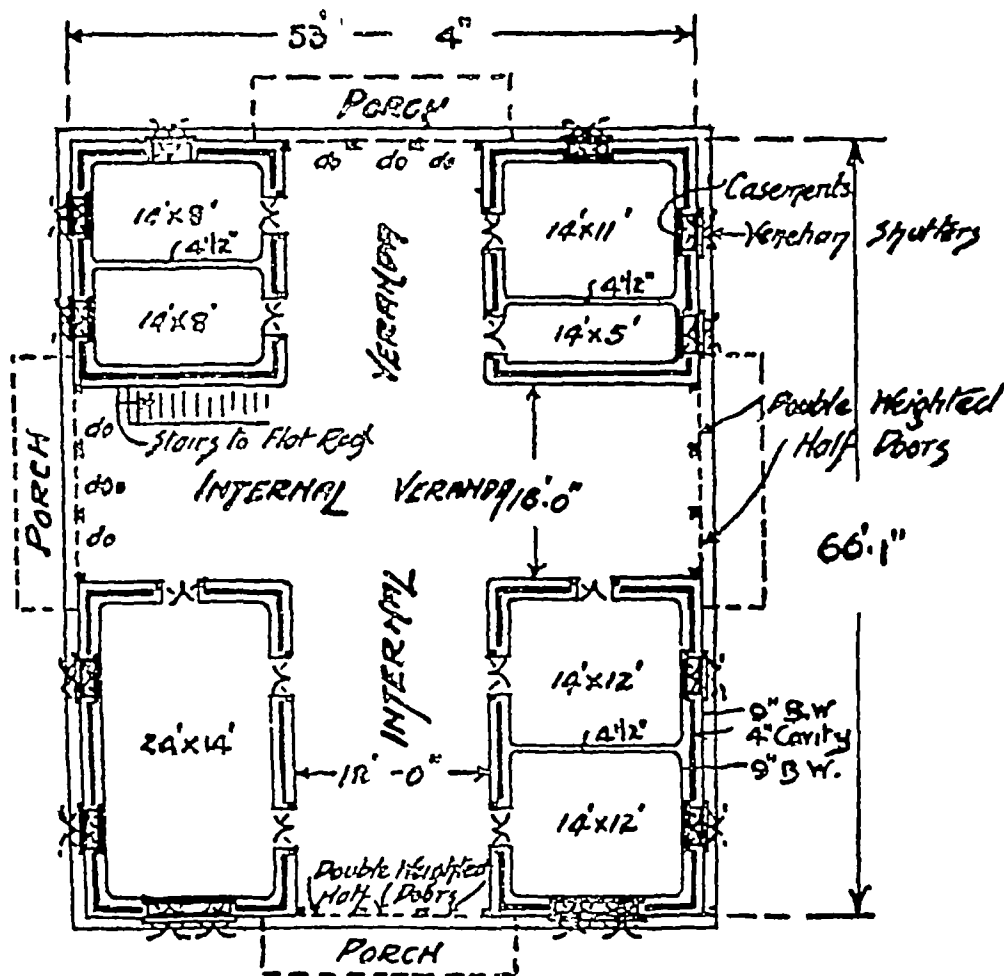
Burn-blebs and their treatment—Ziegelman and Mangan recommend that the blebs should be carefully aspirated and then filled with a 4 per cent solution of sodium bicarbonate. The blebs may again be aspirated and refilled after 4 to 8 hours. Great care must be taken not to break the skin, and if dressings be required, the bleb should be covered with ambrine, or the dressings should consist of paraffin gauze. They point out that the serum contained in burn-blebs is toxic, and must be removed (*Am Journal of Surgery*, 1920, 34, 10).

Incomplete abortion—King points out the utter impossibility of sterilising the vagina and cervix, and the consequent danger of using the curette in cases of incomplete abortion. He uses a sponge-forceps to remove the uterine contents, and then by its means introduces a sponge which is twisted round the uterine cavity to bring away anything that may have been left. As an indication that all has been brought away the cessation of bleeding is valuable. Should bleeding persist, as it does in rare cases,

the canal is packed otherwise nothing is done—no douches, no chemical applications. "The after-treatment is simply rest, local and general, for three to six days. The patient is allowed up as soon as the uterus has involuted well, and she is discharged two or three days later"—(*New Orleans Med and Surg Journal*, 1920, 7, 540)

In the *Annals of Tropical Medicine and Parasitology* (1920 1, pp 313-336 and 351-412) there are articles on the metabolism of white races living in the tropics, and tropical Australia and its Settlement, which are well

the skin and its coverings, was carefully estimated by two thermometers, wet-bulb and dry-bulb, which were prevented from touching the skin by being enclosed in a small wire cage, and the results corroborated Rubner's remarks that a clothed man always lives in a tropical climate as far as his body is concerned. Incidentally it was found that the temperature in the rectum was, in the hot season, between 98.8 degrees and 99.4 degrees F and in the cool season between 98.2 degrees and 98.7 degrees F when the subject was at rest indoors, out of doors the rectal temperature ranged between 98.6 degrees and 99.7 degrees F, and when walking and carrying a load of 13 kilos for fifteen min-



C. D. LYNCH
ARCHITECT

worth reading. In the first article Young details elaborate experiments made to ascertain the influence of external temperature and the rate of cooling upon the respiratory metabolism. Carried out as these experiments were on persons actually living in the tropics, they have much more value than any experiments carried out under artificially produced "tropical" conditions. The skin-shirt temperature, *i.e.*, the temperature of the layer of stagnant air between

utes on the flat at the rate of three miles per hour, it went up to 100.2 degrees F.

The loss in body weight during walking exercise when the dry-bulb registered 87.8 degrees F and the wet-bulb 79.7 degrees F after an hour's walk was 740 g—solely due to profuse perspiration. This, Young says, and we agree with him, shows how necessary it is to supply the body with sufficient water in the tropics. Years ago, we heard an old *shukari*

asseverate that the less water one drank the better when one was after tiger in the hot weather. He may have suffered but little inconvenience from acting on this precept, we found it to be physically impossible to cut down the quantity of fluid ingested, and remain fairly comfortable during the process. We found that, however grateful to the palate and gullet iced drinks might be as thirst-quenchers, they were inferior to *very hot weak* tea, sipped by teaspoonfuls, which had the additional merit of permanently removing the disagreeable bitter taste that was produced by the profuse loss of water through the skin.

Commenting on the physiological changes produced on the white man by residence in the tropics, Breinl and Young express their disappointment at the scrappy nature of past observations and their unscientific basis. But they do accept *neurasthenia*, varying from inability to concentrate attention on one's work up to uncontrollable outbreaks of temper, as a real and fairly frequent result of long residence in the tropics. They believe that it begins by increased output of energy consequent on the stimulation conveyed by the new and strange environment, that thus the energy capacity becomes overdrawn, and that by the time that the newcomer realises that he cannot do the same amount of work in the tropics as he did at Home, the mischief has been done. Combined with this, the monotony and discomfort of life and climate, the lack of pleasures and excitement, and the long distances from centres of civilisation, act to increase the condition. We recommend the perusal of this article to those who, for reasons best known to themselves, do not wish to believe in the existence of tropical neurasthenia, but prefer to view outbreaks of *Tropenkoller* as evidence of mere bad breeding.

They give a plan, devised by Mr C D Lynch, of a house for the tropics, which merits the serious attention of architects and officials of the Public Works Department in India. It is built of reinforced concrete or brick, and has *double outer walls*, between which is a three-inch air-space, suitably ventilated, which obviates the necessity of verandahs. The floor space has a cross-shaped central room on to which open other rooms. We give here the sketch—which makes one feel that those who are now thinking of building flats in Calcutta could not do better than imitate it.

An Appeal for Living Specimens of Fly Maggots from Cases of Cutaneous and Intestinal Myiasis in Man.

MAJOR W S PATTON, I M S, Director, Pasteur Institute of Southern India, Coonoor, sends the following appeal for publication—

It is well known that many flies, especially the familiar blue banded and hottles and the large grey, striped, fleshy *Calliphora vicina* deposit either their eggs or living maggots in the human body

under certain conditions. This most often happens when there is an existing open sore, such as ulcers of all kinds, cuts and abrasions, etc., on any part of the body, offensive discharges from the nose, mouth and ears also attract these insects. The maggots burrow into the tissues and cause extensive damage, especially in such situations as the scalp. Others again gain access to the intestinal tract through food, and may lead to obscure intestinal disorders, in this case the maggots are passed out in the faeces.

It is of the utmost importance that we should have accurate information regarding the species which cause these painful conditions, and this can only be accomplished by collecting living specimens of the maggots. The writer appeals to all medical officers, who alone have the opportunity of seeing these cases, to send him specimens of the living maggots together with a short note of the case.

When maggots are discovered in sores, etc., it is usually the custom to apply such fluids as chloroform, turpentine, etc., in order to get them out of the tissues and at the same time to destroy them. Before doing this, would all medical officers who come across such cases please send some living specimens of the maggots to the writer? They should be carefully handled so that they may not be damaged and placed in a small tin with some moist earth, the lid of the tin being perforated with fine holes to admit air, the tin should be nearly filled with earth so that the contents may not be subjected to too much movement during transit. The tin should be securely packed and sent at once to the writer. All dead specimens should be pickled in 80 per cent alcohol, as these are of some help in identifying the genus to which the fly belongs. It should, however, be clearly understood that the species can only be identified by *hatching out the fly*, and this is only possible with *living material*. The writer will be glad to send any medical officer who is willing to collect specimens suitable tins and tubes containing 80 per cent alcohol, and will also give any further information which may be desired.

Notanda Passim.

In a recent murder trial the Lord Chief Justice of England upheld the theory that it is the law and its exponents who alone are competent to decide the question of the sanity of an accused person. Of course, this is nonsense. The lawyers, whether at the Bar or on the Bench, are quite as unfit to deal with the subject of mental disorder as is the man in the street. By training and bent the legal mind rests on authority. The older the authority the better, instead of the more likely to be in error, as it is. The notorious pronouncement in the Macnaghten case has warped the minds of the gentlemen of the long robe, so that they cannot see that a "learned" judge in a case concerning mental soundness is just as much in need of skilled assistance as if he were trying a case of collision on the high seas. In the latter case he would be helped by technical experts. In the former he has to rely on his own ignorance, and, what is worse, on his ignorance that he is ignorant of the subject.

Here in India we have found much more intelligent appreciation of medical evidence in such cases than is met with at Home. What the reason for this may be we leave to our readers to guess.

In the April number of *Science Progress*, the Editor, Sir Ronald Ross has a good note on Awards for Medical Discovery. Exceptionally lucky as he has been he pleads the cause of his less fortunate brethren and pleads it well. But in the same number he has written a railing article against the State for its neglect to act on his advice and compass the elimination of malaria from the earth. Obviously he hopes that this railing will not fall on deaf ears else he would not have taken the trouble to set forth his grievances. We do not feel sanguine as to the result for those who govern all nations are not concerned with the things that really matter. Politicians have no time for anything that is not likely to tickle the palate of the ignorant voter and by so doing tend to keep them in Place and Power with their corollary Pelf. They are ill-instructed half-educated men who do not lead but are pushed this way or that by the capricious crowd. Some day—centuries hence—the average man will have received a real education and will insist on being governed by an oligarchy of the aristocracy of intellect. Then no suggestion made by a man of science will be “turned down” merely because it is not likely to catch and keep votes. Then selfishness will be a crime being against the clear purpose of Nature to preserve the species at the expense of the individual numbers thereof.

POSTAL NOTICE

INSERTION OF THE NAMES AND ADDRESSES OF SENDERS ON THE COVERS OF ARTICLES POSTED

ATTENTION is specially invited to clause 43 of the Post Office Guide, which requires the sender of a postal article to add his name and address on the lower left-hand corner of the cover, so that it may be returned to him unopened in case of non-delivery. A large number of imperfectly addressed articles is destroyed every year in the Dead Letter Office for want of this information.

G. R. CLARK,

Director-General of Posts and Telegraphs
CALCUTTA, The 15th April, 1920

Reviews.

CLINICAL METHODS—By G. T. BIRDWOOD, M.A., M.D., D.P.H., Lieut.-Col., 1st MS. Third Edition. Calcutta 1920. Thacker, Spink and Co. Price Rs 7-8.

THE third edition of this handy vade mecum contains much more information than did even the second edition, which sold so well, because it was found to be of great use to workers in the mofussil. All that it contains is accurate, which is the best praise that can be given to a work of its kind. When he has this work with him, the practitioner will never be at a loss how to deal with many of the important matters which crop up each day in Indian practice.

PRACTICAL PHARMACOLOGY FOR THE USE OF STUDENTS OF MEDICINE—By W. E. DIXON, M.A., M.D., F.R.C.S. Cambridge, 1920. University Press. Price 7s 6d net.

THIS little work is a guide to the performance of easy experiments which illustrate the

actions of drugs in common use. It does not, unfortunately, deal with decerebrate mammals, but is of use nevertheless for the student will learn much concerning the real, as distinguished from the supposed, action of drugs that he will not readily gather from more pretentious works.

THE SEXUAL DISABILITIES OF MAN—By ARTHUR COOPER. Fourth Edition. London, 1920. H. K. Lewis and Co. Price 10s 6d net.

THE author of this book may be congratulated on having made a laudable attempt to reduce to a small compass a very large and complex subject. The first part of the book is devoted to a detailed account of the morbid conditions of the human semen and to the treatment of sterility. Part II deals with sexual impotence. The author starts by defining impotence as an “inability to perform the normal sexual act,” a definition which lacks a good deal of precision and would certainly not include certain forms of psycho-sexual impotence. The definition would be improved were it made to read, “a complete or incomplete inability satisfactorily to carry out the act of *coitus per vaginam*.”

The author then proceeds to divide impotence into primary and secondary. Under the latter heading he tabulates the causes of impotence which are characterised by “some definite preceding morbid condition general or local,” *viz* induration of the penis, varicocele, diseases of the central nervous system, phthisis, malaria, X-rays, etc., etc. Primary impotence is defined as impotence for which no such cause can be found, *i.e.*, no preceding morbid condition, general or local. It is, therefore, somewhat of a surprise to find among the causes of primary impotence references to certain morbid conditions of the mind. One is led to conclude that “a morbid condition” connotes to the author solely a morbidity of the tissues of the body, although he does cite “neurasthenia” as a cause of secondary impotence. The conclusions reached on p. 115 in relation to overwork as a cause of impotence are far from convincing, and they become all the less so by the citation of the case of Sir Isaac Newton in support of them. The author appears to have overlooked the fact that Newton, apart from his stupendous genius in a special field, was an incomplete and unsatisfactory human being, who ultimately reached a condition near akin to insanity. We think, indeed, that the subject of psychical impotence does not receive very clear or satisfactory treatment from the author. For no mention is made of the most important single cause, which may well be called *the* specific cause, of psycho-sexual impotence, namely, *unconscious* incestuous fixation, dating from early childhood, which results in many men being impotent with the woman they love, but able to develop high sexual capacity and pleasure with an inferior woman in whose society ethical and æsthetic scruples need not be

considered, and with one who is a complete stranger. In his remarks on the treatment of psychical importance the author discloses the light-hearted optimism of the surgeon, in a way that might well stagger the work-a-day psycho-therapist.

Under the heading of Prevention of Impotence, the author discusses shortly the problem of how best to explain sexual matters to children, especially to boys, and he refers to instances where the teaching of "Sex Hygiene" has not met with success, both in America and in Great Britain.

The subject is admittedly a very complex one, and it may lead in time to a reconsideration on the part of so-called civilised man as to whether or not he would do well to imitate the example of certain primitive races, whom he is now pleased to despise, by instituting ceremonies of initiation into manhood which involve not merely education in the ordinary sense, but a stern discipline of the character, feats of endurance, the trial of character—in short, the testing of the muscles of the soul as much as of the body. At present no such instruction has found a place in the curriculum of any school in Europe or America. The chapter devoted to Venereal Diseases contains views of the author that are both moderate and thoroughly sensible, so that one could wish that he had found it possible to prolong his discussion of this aspect of the sexual disabilities of man. Similarly on the subject of continence he has some quite sound observations to make, although he appears to make the very common mistake of failing to emphasise the biological fact that the act of healthy sexual union is the satisfaction of the erotic needs, not of one person, but of *two* persons. The postscript on "Sexuality and War" does not represent much else than a collection of somewhat *ex cathedra* utterances on the part of a few more or less well-known medical men, and the opinions expressed are frequently contradictory. The book is of a handy size and is furnished with satisfactory indices of authors and subject-matter.

THE AFTER-TREATMENT OF SURGICAL PATIENTS—By WILLARD BARTLETT, A.M., M.D., F.A.C.S., and Collaborators. Vols I and II, pp 1066, 222 original illustrations and 1 coloured plate in Vol I, and 213 original illustrations in Vol II. St Louis, 1920. C. V. Mosby Company. Price \$10.00.

THE two volumes of this book contain a considerable store of surgical information, based on the personal experience of the authors of work done in the Mayo Clinic, and on extracts from the works of many well-known authorities. The After-Treatment of Surgical Patients is dealt with in a much more ambitious way than in most books of this type. Take as an example the excellent chapter on Fat Embolism by O. F. McKittrick, before the actual lines of treatment are discussed, the history of this complication is gone into, its pathology described, and the surgical operations which most

commonly produce it are mentioned. A bibliography completes most chapters.

Most of the surgical advances made during the war are alluded to, though we would have liked to have seen the subject of fractures more fully dealt with. The illustrations are numerous and excellent and many useful devices are shown.

We congratulate the authors on producing a work which will be of great value to senior students and to all surgeons. Every Civil Surgeon in India will find a copy valuable, particularly those associated with large hospitals.

Our only criticism is that the volumes savour too much of compilation and there is some lack of balance in dealing with the more important and less important sections. There are many minor points that some would criticise, but it is as well to remember that a book on surgery depicts a constantly shifting scene in which individual opinions and endless research must always play their part.

Correspondence.

To the Editor of THE INDIAN MEDICAL GAZETTE

SIR,—In the February number of *The Indian Medical Gazette*, of the current year, there is an extract headed "An Amplification of Young's Rule," in which it is said that Young's Rule is inadequate in the case of infants, *vide* page 65.

My contention is that it is not so, and there can be no real difficulty if the prescriber takes a little trouble to make his mental calculations in fractions. What has been put forward as a modification or amplification by Cloud is in reality Young's Rule in disguise, only the mathematical calculation has been shown in a simplified form. Let us calculate from the example cited by Cloud, *eg*—

(1) At five months, the dose will be—

$$\begin{aligned} & \frac{5}{12} \text{ yr} \times 12 = \frac{5}{12} \\ & = \frac{5 + 144}{12} = \frac{5}{12} \\ & = \frac{149}{12} \times \frac{12}{5} = \frac{149}{5} = 30, \text{ i.e., } \frac{1}{30} \text{ approx} \end{aligned}$$

(2) At 16 months, the dose is—

$$\begin{aligned} & \frac{16}{12} \times 12 = \frac{16}{12} = \frac{16}{12} \times \frac{144}{12} \\ & = \frac{160}{10} = 10, \text{ i.e., } \frac{1}{10} \end{aligned}$$

Therefore, where is the difference? So we can neither accept it as an amplification nor as a modification of Young's Rule. We can at best call Cloud's method a simplification of mathematical calculation, nothing more.

Yours, etc,

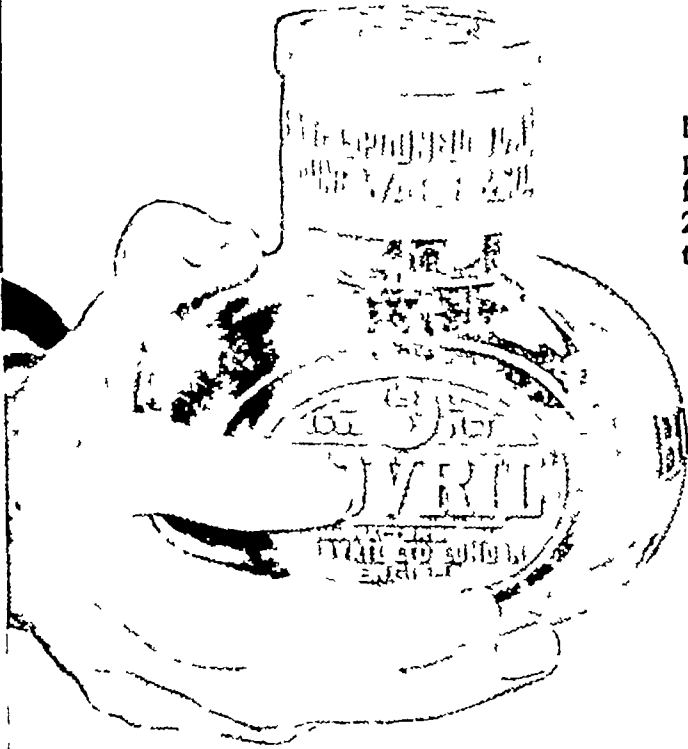
R. K. BHATTACHARYA, M.B.

NABADWIP, 1st May, 1920

Service Notes.

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the 4th August, 1919—

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SUBJECT to His Majesty's approval the services of temporary Captain J Nasarwanji Hormasji Choksi are dispensed with on account of medical unfitness with effect from the 25th December, 1919

To be Honorary Surgeon to H E the Viceroy
LIEUT COL P W SUTHERLAND, CIE, MD IMS
vice Brevet Col R Heard, MD IMS, appointed Surgeon to H E the Viceroy

To be Surgeon to H E the Viceroy
BREVET COL R HEARD, IMS vice Lieut-Col H A Smith CIE, MB, IMS, appointed Inspector General of Civil Hospitals, Bihar and Orissa

In the notification in the *London Gazette* dated 1st December 1916 making certain promotions in the I M S, for "24th July 1914" above the names of Edward Randolph Armstrong MB and Charles James Stocker MB read "29th July, 1914"

In exercise of the power conferred by section 10 of the Indian Universities Act 1904 (VIII of 1904) His Honour the Chancellor of the Allahabad University is pleased to nominate the following gentlemen to be ordinary fellows of the said University —

1 Lieut Col W Young MB CM IMS Civil Surgeon Lucknow

2 Major M R C MacWatters MB FRCS IMS Professor, King George's Medical College Lucknow

CAPT L A P ANDERSON IMS Military Medical Officer Allahabad to hold civil medical charge of the Allahabad district in addition to his military duties during the absence on privilege leave of Lieut-Col R G Turner CMG DSO, IMS

CAPT E S PHIPSON, DSO MB IMS is confirmed in the appointment of Health Officer Simla, with effect from the afternoon of the 13th October 1918

The following appointment is made with effect from the date specified —

Major H C Keates IMS, Civil Surgeon, on general duty Mayo Hospital Lahore with effect from 31st January, 1920 (forenoon)

The undermentioned officers are permitted subject to His Majesty's approval to resign their commissions with effect from the dates specified —

Temporary Captain Gilbert Eugene Paul Dated 10th December 1919

Temporary Captain Bhumonjee Nowrojee Burjorjee. Dated 14th February 1920

Temporary Captain Hirji Dorabji Gimi Dated 2nd March 1920

Temp Lieut to be temp Capt

R. C WATTS 26th Sept., 1919

MAJOR J MORRISON, MB IMS of the Bacteriological Department, is granted privilege leave for six months combined with furlough on average salary for two months with effect from the 15th April 1920 or any subsequent date on which he may avail himself of the leave.

MAJOR H B DRAKE IMS, officiating Assay Master Calcutta, has been posted as officiating Assay Master Bombay with effect from the forenoon of the 15th March 1920. The duties of the Assay Master Bombay for the 13th and 14th March 1920 were performed by Mr C R. Robson BSc. Deputy Assay Master Bombay

The services of the undermentioned officers of the Indian Medical Service are placed permanently at the

disposal of the Government of Madras, with effect from the dates noted against their names —

Major A J H Russell, MD 13th July, 1919

Major A S Leslie, MB 26th July, 1919

Major F C Fraser 26th July, 1919

The services of Majors Leslie and Fraser will remain temporarily at the disposal of His Excellency the Commander-in-Chief in India

The KING has been graciously pleased to approve of the undermentioned rewards, on the recommendation of the Government of India for distinguished service in connection with Military Operations in Persia (Bushire Force) Dated 3rd June, 1919 —

To be Brevet Major

Capt (A|Lt-Col) H R B Gibson, MB, IMS

The names of the undermentioned have been brought to the notice of the Secretary of State for War for valuable services rendered with the Bushire Force in Persia during the period from 1st April, 1918, to 31st March, 1919 Dated 3rd June, 1919 —

Beatson, Captain B F, IMS, Bowle-Evans, Lt-Col (T|Col) C H CMG, MB, IMS, Cameron, Major A MB IMS, Gibson, Capt. (A|Lt-Col) H R B IMS, Halliday, Major (A|Lt-Col) H, MB, IMS, Jolly Maj (A|Lt-Col) G A, MB, IMS, Joshi T|Capt N, IMS, Khosla, T|Capt. R. N, IMS, Lapsley, Major (A|Lt-Col) W, MB IMS, Mitra, T|Capt P N, IMS, Oonwala T|Capt. J H, IMS, Rao T|Capt. B S, IMS, Singh (T|Capt) M.A, MB, IMS

MAJOR J S O'NEILL, IMS, Military Medical Officer to hold charge of the Civil Surgeoncy of Meerut, in addition to his own duties, vice Lieut-Col A W R. Cochrane IMS transferred.

LIEUT-COL. R. G TURNER, CMG, DSO IMS Civil Surgeon Allahabad is granted privilege leave for three months with effect from the 15th April 1920 or subsequent date

LIEUT-COL E J O'MEARA, OBE, IMS, Civil Surgeon and Principal, Medical School Agra, is granted privilege leave combined with furlough on medical certificate for a total period of one year, with effect from the date he may take it

On relief by 2nd Grade Assistant Surgeon Narbada Prasad Shrivastava, LM&S, Lieut. Col A Buchanan, MA MD, MCh, MAO, IMS Civil Surgeon, Nagpur, is appointed to be Civil Surgeon, Pachmarhi, for the half of May and the month of June, 1920

LIEUT-COL W D HAYWARD MB IMS, Medical Store keeper to Government, Calcutta is granted combined leave *ex India* for 8 months i.e. privilege leave for 1 month and 5 days and furlough for the remaining period, with effect from the 2nd January 1920 under the terms of Articles 233 and 241 Civil Service Regulations

This office Notification No 1 dated the 17th February 1920 is hereby cancelled

The KING has approved the retirement of the following officer and the grant of rank as shown below —

INDIAN MEDICAL SERVICE.

Capt G L C Little, MB F.R.C.S.E in consequence of ill-health 5th February 1920

INDIAN MEDICAL SERVICE

The following acting promotion is notified, subject to His Majesty's approval —

Major G G Hirst to be acting Lieut-Col. while commanding No 3 Combined Field Ambulance, East African Expeditionary Force, from the 4th July, 1917, to the 29th July, 1917

SUBJECT to His Majesty's approval, the services of the undermentioned officers are dispensed with, with effect from the dates specified —

Temporary Captain Kumud Behari Chowdhuri Dated 14th March, 1920

Temporary Captain Mohim Lal Deb Dated 20th March, 1920

Temporary Lieutenant Therathawathu Cheriyan Mathew Dated 24th January, 1920

SUBJECT to His Majesty's approval, the services of temporary Lieutenant Vishwanath Hari Bedekar are dispensed with on account of medical unfitness, with effect from the 15th March, 1920

THE undermentioned officers are permitted, subject to His Majesty's approval, to resign their commissions, with effect from the dates specified —

Temporary Captain Dhanjishaw Phirozeshaw Karaka Dated 19th February, 1920

Temporary Captain Francis Barlow Ambler Dated 9th March, 1920

IN exercise of the powers conferred by section 10 of the Indian Universities Act, 1904 (VIII of 1904), His Honour the Chancellor of the Allahabad University is pleased to nominate the following gentleman to be an ordinary fellow of the said University —

The Hon Colonel J K Close, I M S Inspector-General of Civil Hospitals, United Provinces

LIEUT-COL J M WOOLLEY, I M S, Inspector-General of Prisons, United Provinces, is granted privilege leave combined with furlough on full average salary for a total period of eight months, with effect from the 1st April, 1920, or subsequent date

IN exercise of the powers conferred by Regulation XI, Clause (a), of the Regulations for the nomination and election of members of the Legislative Council of the Chief Commissioner of the Central Provinces, the Chief Commissioner, with the previous sanction of the Governor-General, is pleased to nominate Colonel C R M Green, I M S to be a member of the Council in place of the Hon Lieut-Col C H Bensley, I M S, resigned

LIEUT-COL R H MADDOX, C I E, I M S, is appointed to be Civil Surgeon of Hazaribagh, with effect from the 1st March, 1920

IN modification of Government Notification No 1754, dated the 13th February, 1920, Lieut-Col W M Houston I M S, Health Officer of the Port of Bombay, is granted privilege leave for six months combined with furlough on average salary for two months, with effect from the 3rd April, 1920, or the subsequent date of relief

LIEUT-COL E F G TUCKER, M B, B S, M R C P (Lond), I M S is granted with effect from the 1st May, 1920, or the subsequent date of relief, privilege leave of absence for such period as may be due to him on that date in combination with furlough for such period as may bring the combined period of absence up to one year

IN exercise of the powers conferred by clause (b) of sub-section (1) of section 4 and section 10 of the United Provinces Medical Act (III of 1917), the Local Government is pleased to nominate Major J E Clements, M B, D P H, I M S, to be a member of the United Provinces Medical Council, *vice* Lieut-Col J M Woolley, I M S, resigned

MAJOR C H BARBER, I M S, Professor of Medicine, King George's Medical College, Lucknow, to Aligarh as Civil Surgeon

LIEUT-COL A W R COCHRANE, I M S, Civil Surgeon, from Meerut to Agra

LIEUT-COL E F G TUCKER, M B, B S, M R C P (Lond) I M S, is granted, with effect from the 1st May, 1920, or the subsequent date of relief, privilege leave of absence for such period as may be due to him on that date in combination with furlough for such period as may bring the combined period of absence up to one year

HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to declare that the furlough for six weeks granted to Major A F Hamilton, M B (Lond), F R C S, I M S, in Government Notification No 2609, dated the 9th March, 1920, should be considered as furlough on average salary

MAJOR K. G. GHARPUREY, I M S, is granted, with effect from the date of relief, privilege leave of absence for two months and fifteen days

MR. D A TURKHUDD, M B, C M, Acting Assistant Director, Bombay Bacteriological Laboratory, is granted privilege leave for six months, with effect from the date on which he may avail himself of it.

THE GOVERNOR IN COUNCIL is pleased to appoint Major S W Jones, O B E, I M S, to be Superintendent, Yeravda Central Prison

DR J F LONO, L M & S, D P H, D T M & S, Health Officer of the Nagpur Municipality, is appointed to be Second Deputy Sanitary Commissioner, Central Provinces, on a pay of Rs 500—25—600, for a period of five years, with effect from the date on which he assumes charge of his duties

CAPT C H FIELDING, I M S, to be acting Lieut-Col while commanding an Indian Casualty Clearing Station Dated 12th December, 1919

Captain to be Major

GEORGE FREDERICK GRAHAM, M D Dated 1st February, 1920

THE services of Major H R Dutton, I M S, are placed permanently at the disposal of the Government of Bihar and Orissa, with effect from the 4th November, 1919

LIEUT-COL F P CONNOR, D S O, F R C S, I M S, Officiating Professor of Surgery, Medical College, Calcutta, and Surgeon to the College Hospitals, is appointed permanently to be Professor of Clinical and Operative Surgery, Medical College, Calcutta, and Surgeon to the College Hospitals, *vice* Lieut-Col R P Wilson

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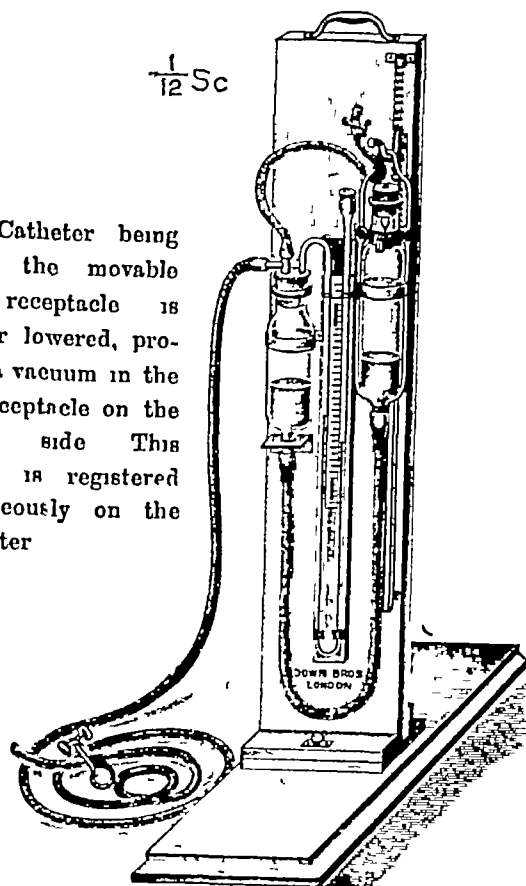
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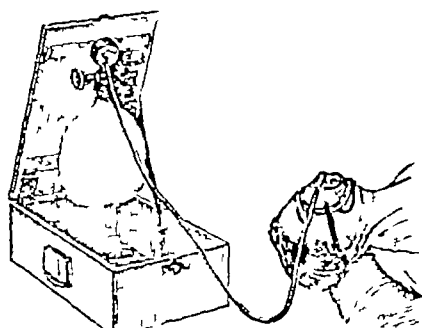


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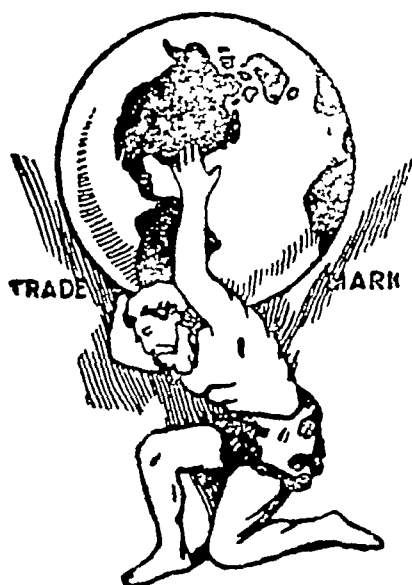
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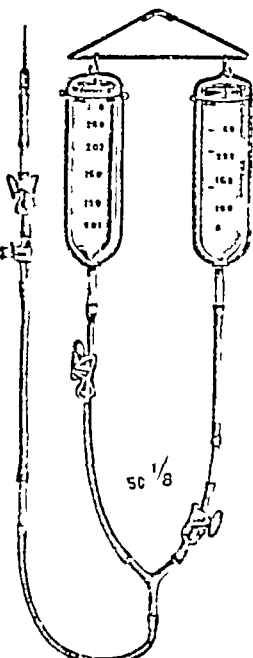
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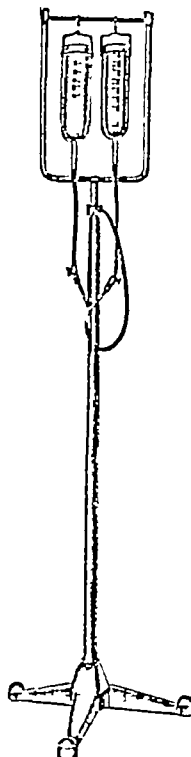
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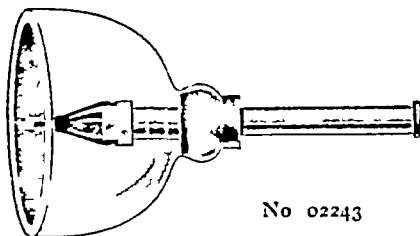


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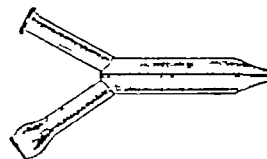
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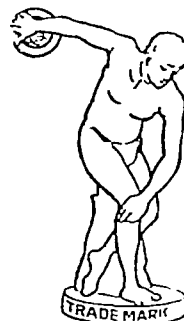
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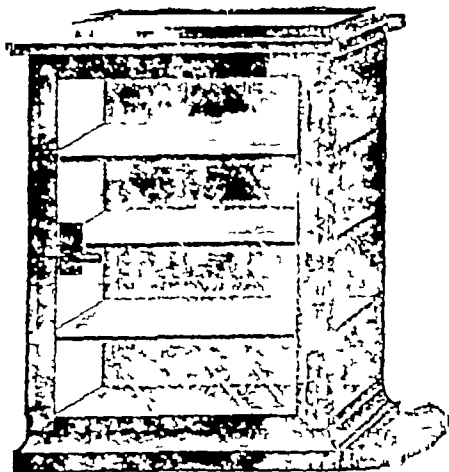


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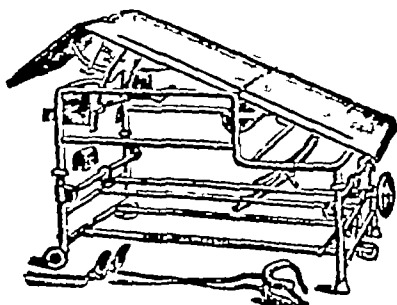
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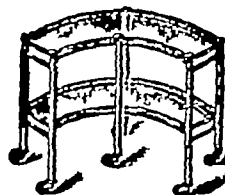


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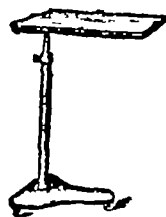
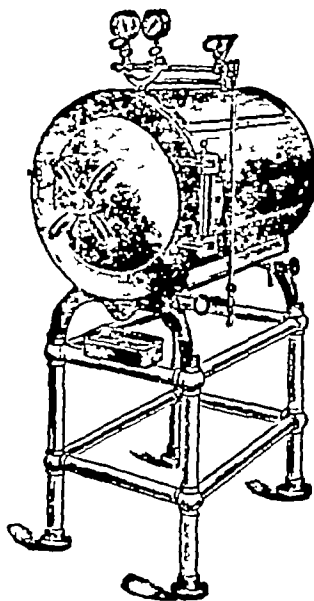


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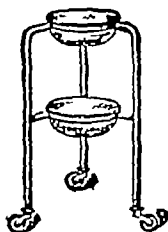


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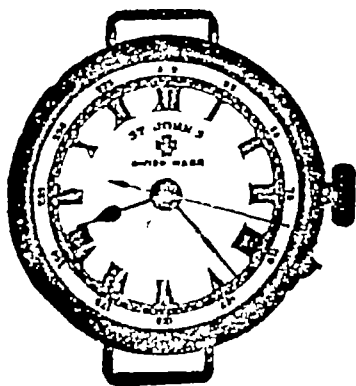
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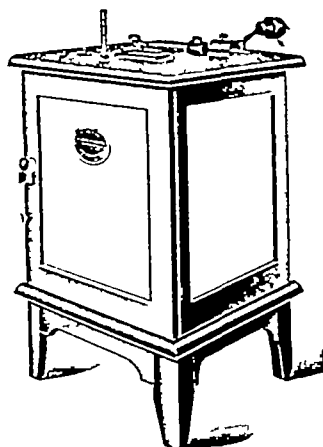
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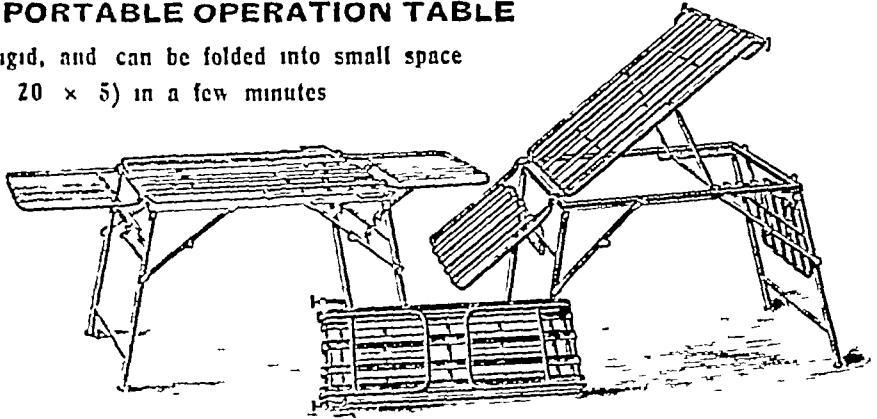
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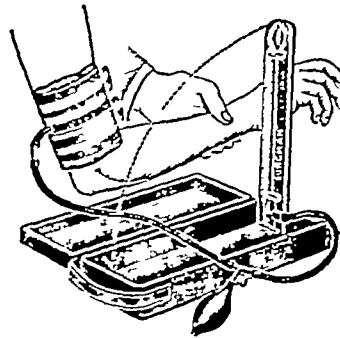
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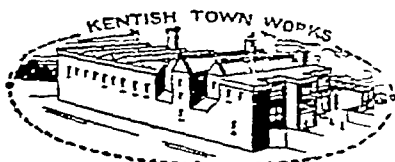
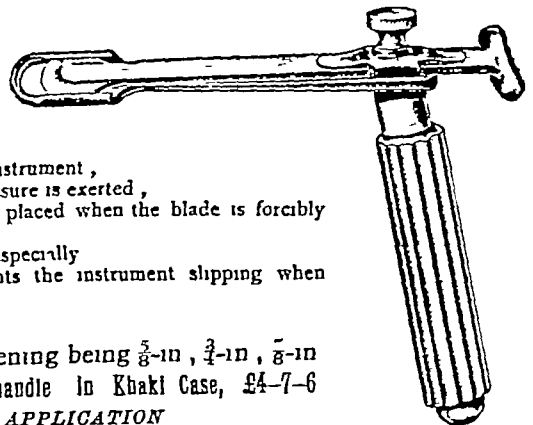
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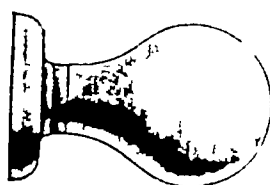
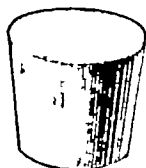
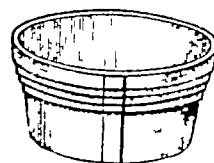
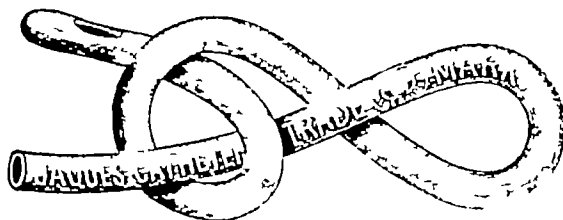
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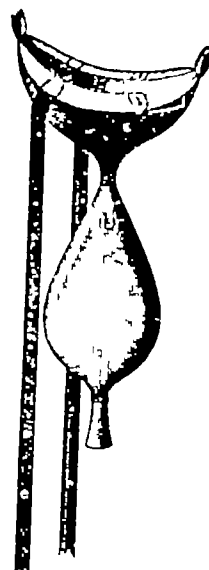
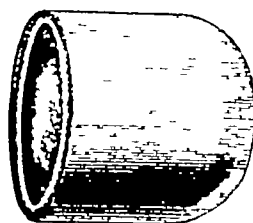


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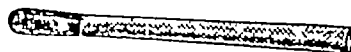
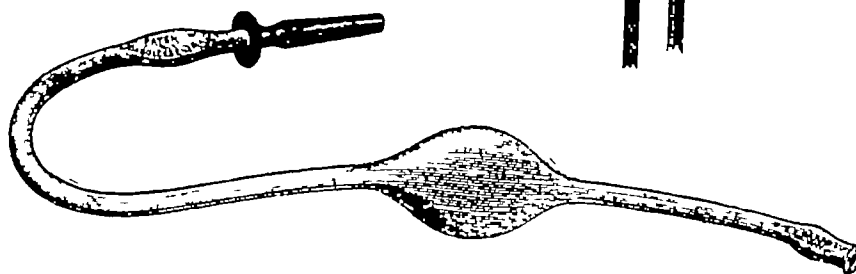
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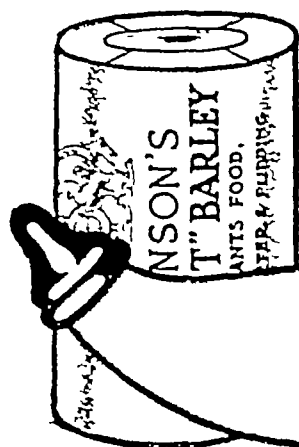


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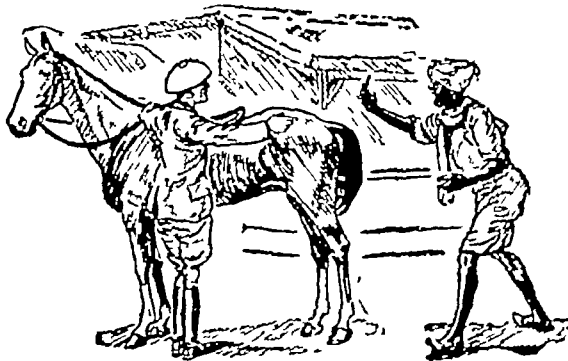
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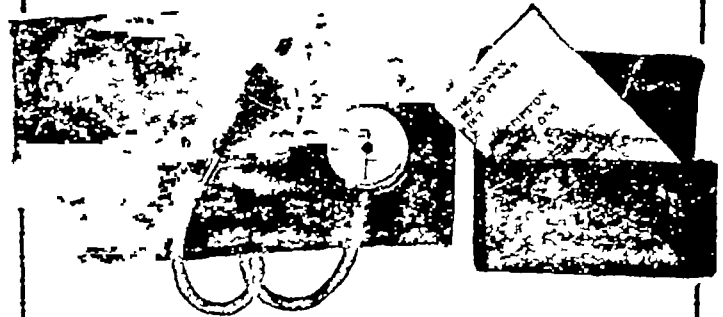
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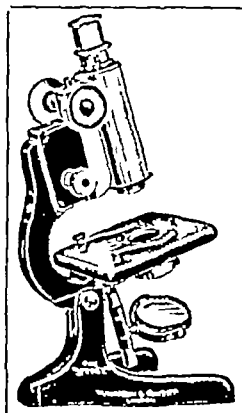
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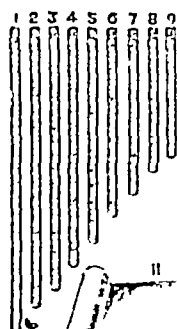
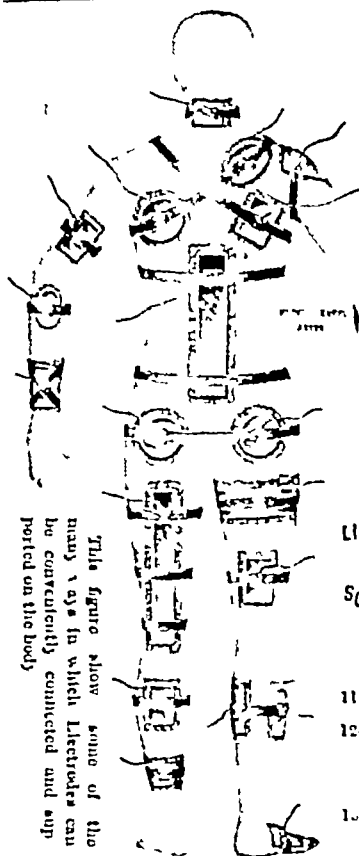
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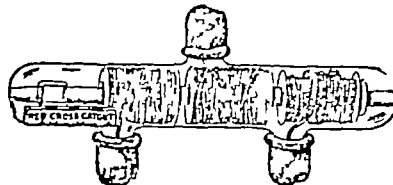
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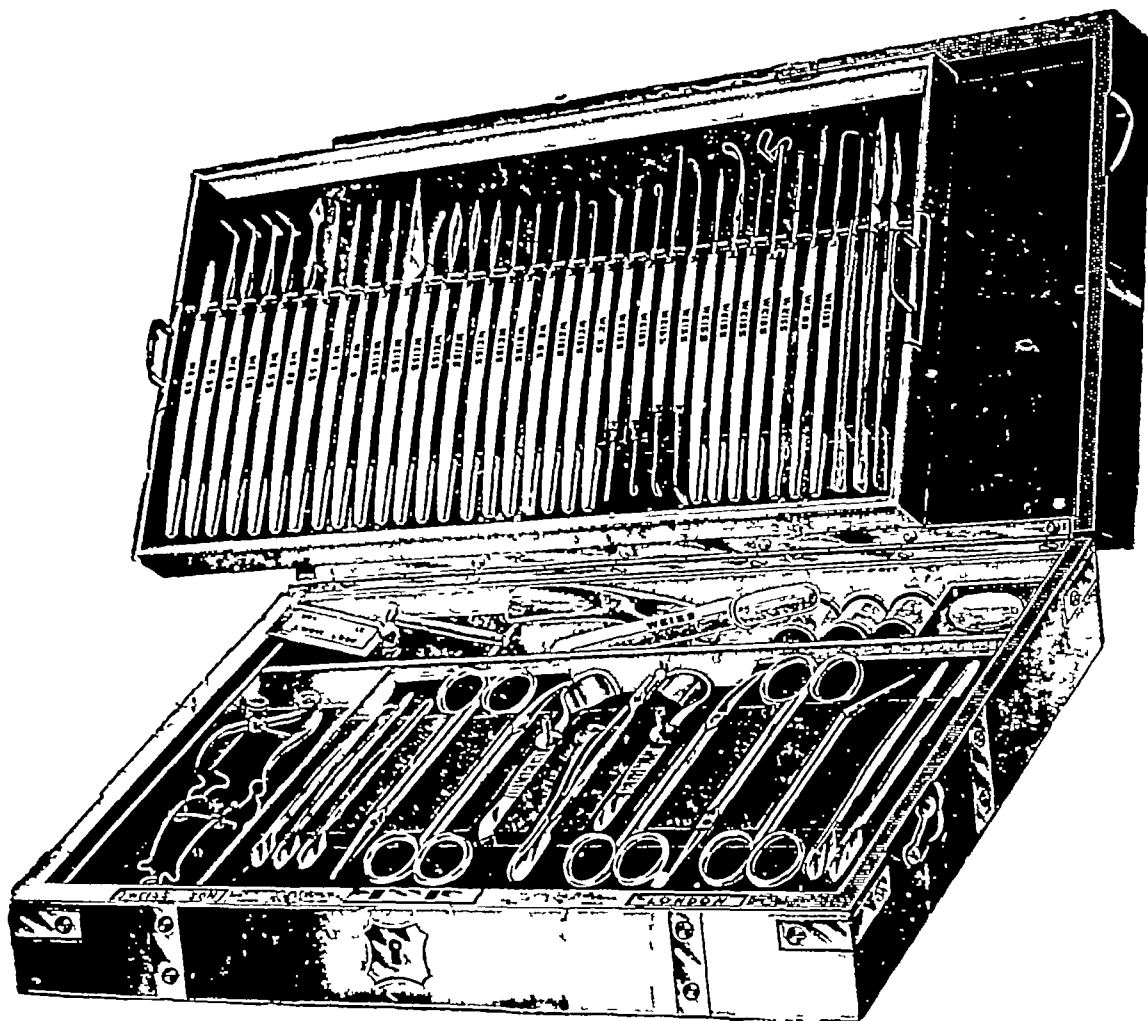
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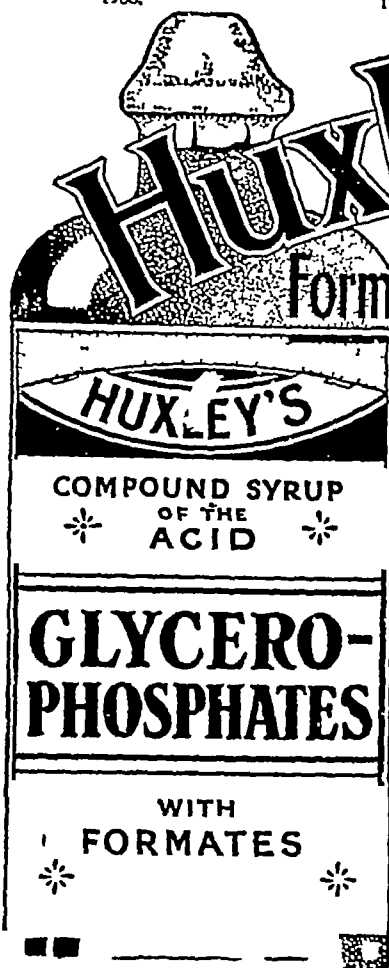
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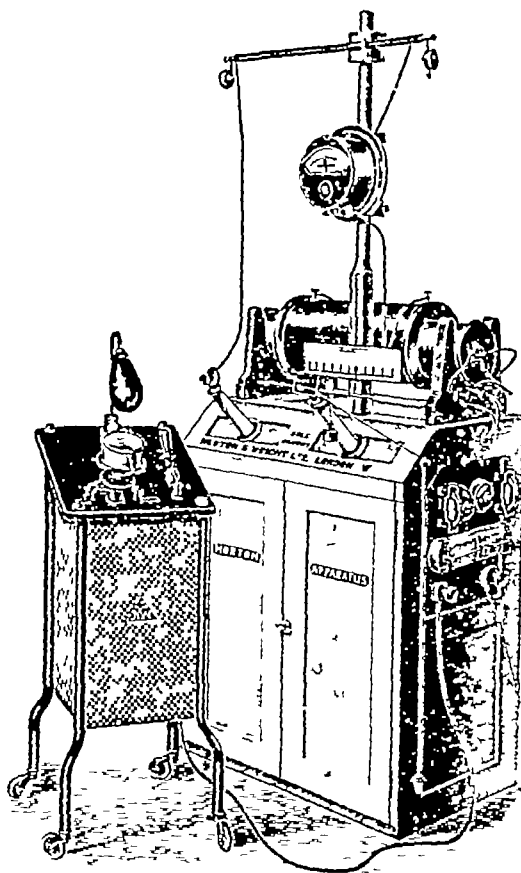
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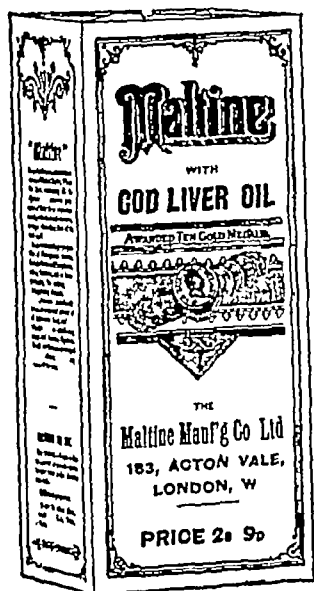
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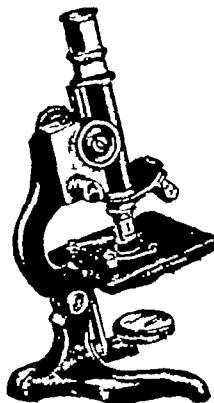
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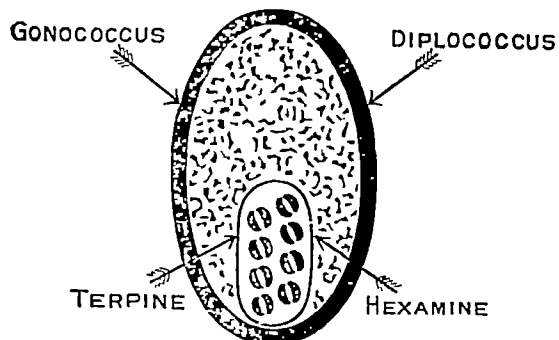
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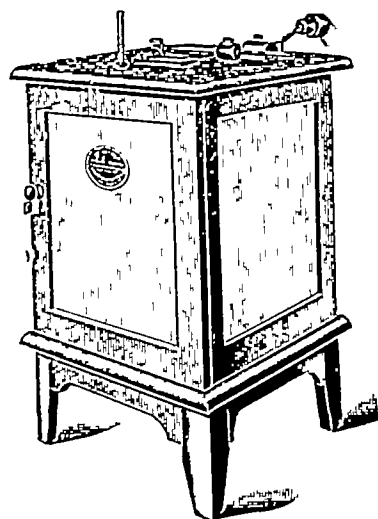
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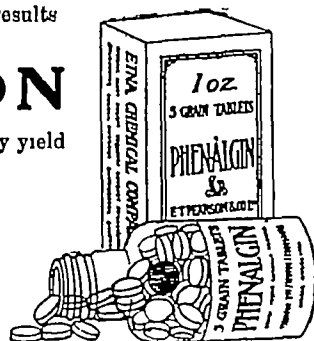
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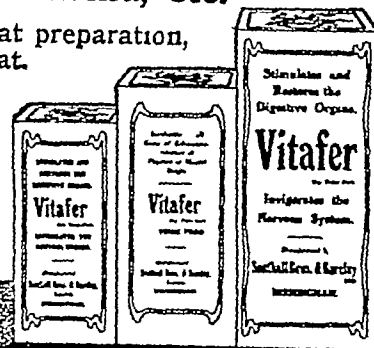
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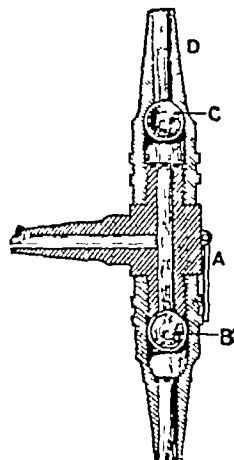
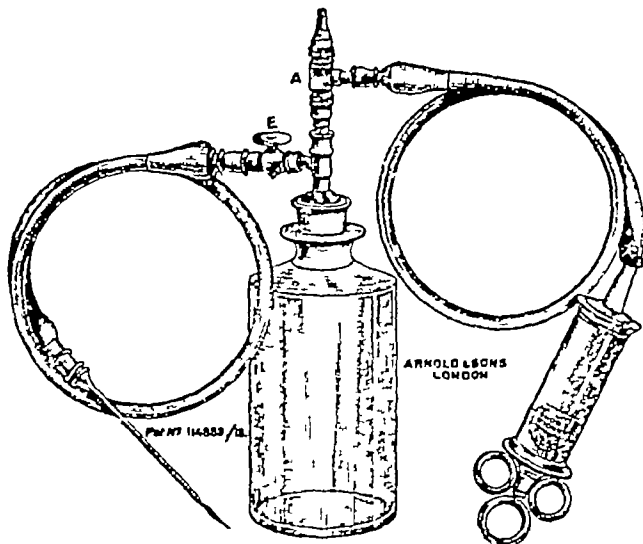
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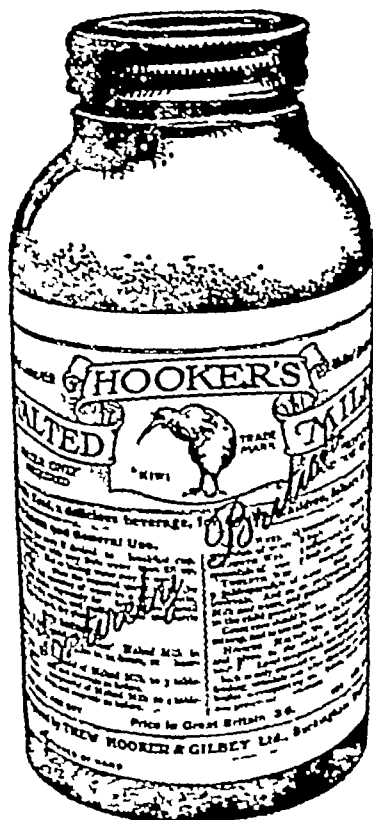
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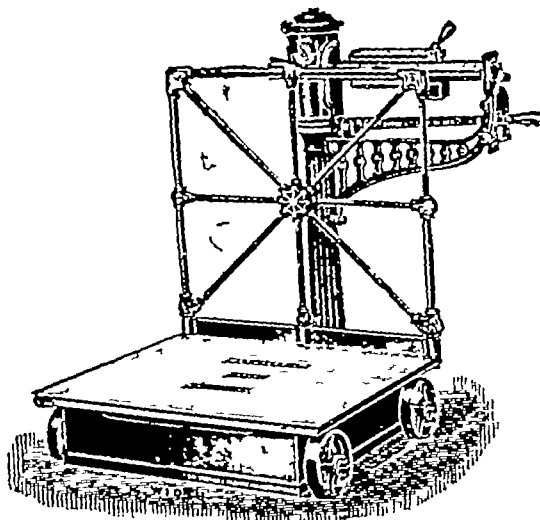
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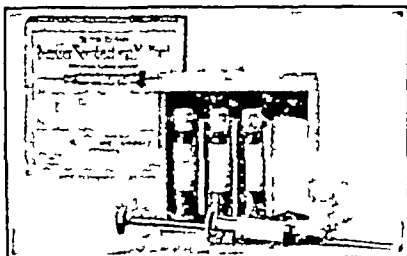
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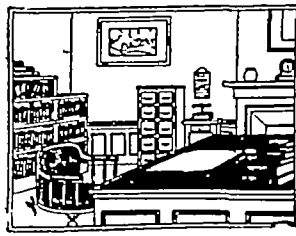
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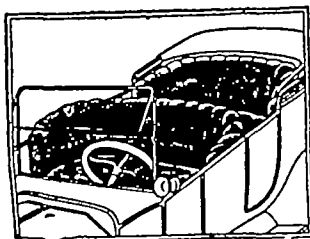
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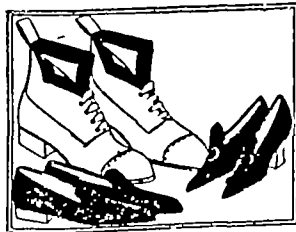
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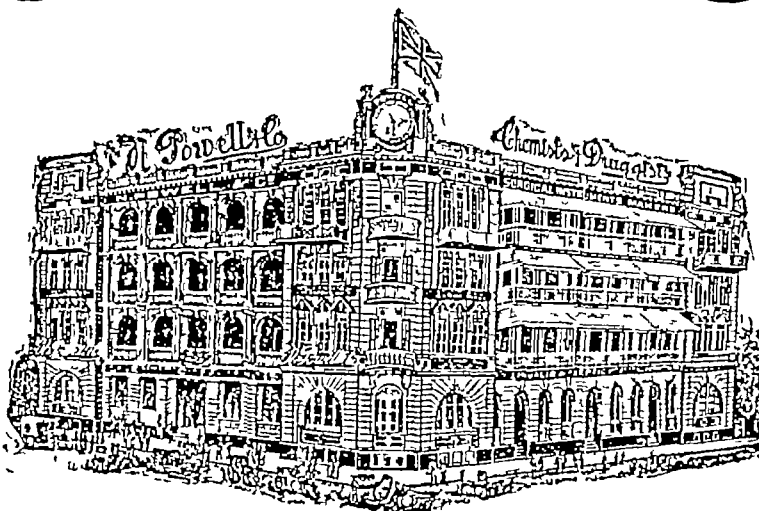
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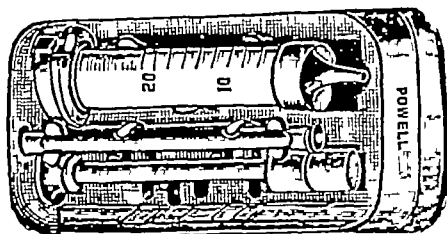
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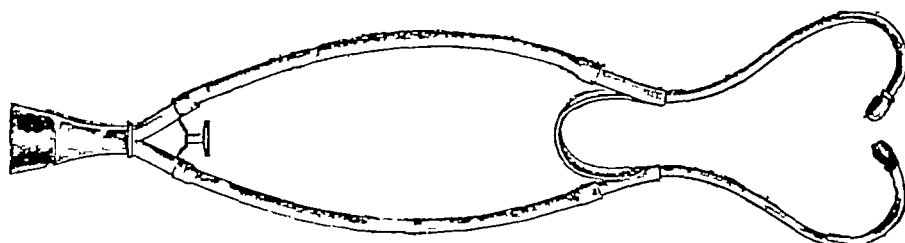
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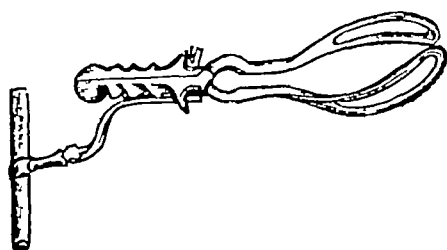
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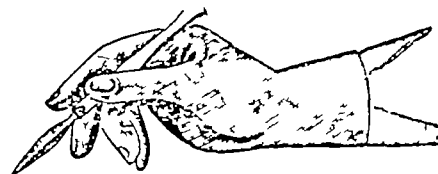


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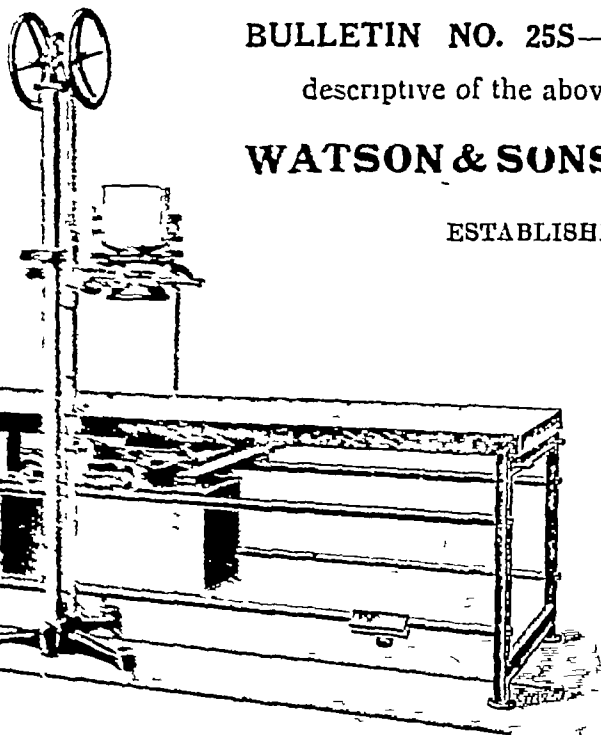
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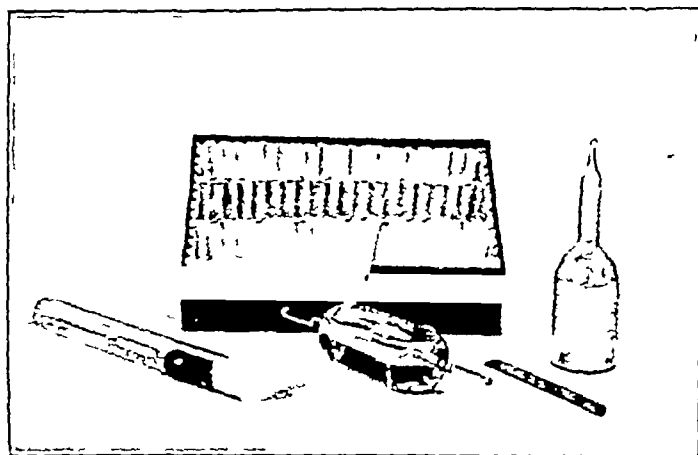


Fig 1

THE OUTFIT (Fig 1)

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COPY OF LETTER FROM AN EMINENT LONDON
SURGEON, 4th April, 1917

"Since writing you last I have had a bad case of Chronic Suppuration of the Antrum of Highmore—many years standing—I operated upon it on March 24th, cavity was filled with foul smelling discharge and polypi which extended to the nose and of the worst kind After cleansing out all the diseased tissue I had it dressed with gauze soaked in MILTON twice daily, a weak solution at first, the ordinary syringing being carried out first. These cases, as a rule, continue to discharge and stink for months after—not so this one—the smell diminished the first day and to-day (10 days) there was no smell or discharge"

AUXILIARY MILITARY HOSPITAL, FRODSHAM, CHESHIRE, 9th August, 1917—Messrs Milton Manufacturing Co., Ltd, John Milton House, 125, Bunhill Row, E.C.

DEAR SIR—Will you please forward 8 gallons of MILTON We have had very good results from the use of this fluid—Yours faithfully (Signed)

EXTRACT FROM LETTER FROM A DENTAL SURGEON,
Rodney Street, Liverpool, 23rd August, 1917

"I wish I could give you as good a report of Milton as it deserves, for I find, as a germicide, and for cleaning up a 'foul mouth,' it is the best thing I have ever tried, for it acts almost instantaneously and does not irritate the mouth I have also tried it for Pyorrhœa and other suppurating troubles of the mouth, and it has been splendid because of its strength without the irritation of nearly all other germicides which we use for Pyorrhœa. I constantly use it, and shall continue to do so"

From—Officer in Charge Supplies
To—Officer Commanding

T/11 August 25th, 1917

Milton's Fluid

Reference to the marginally noted disinfectant I have to inform you that while Mr Smith, the manufacturers' representative, was here, he not only demonstrated this preparation to me, but I also made a test of the same for our own satisfaction

This test consisted of spraying a piece of beef with the solution and leaving the same outside in the sun, the idea being to see the result from flies.

The meat remained in the open air seventy hours before it became fly blown and it is doubtful in my mind if there would have been fly blows at that time, had it not rained the previous night. The rain, no doubt, washed off the solution, but even at that, though the fly blows were in a tissue pocket, and the meat had become dark in colour, externally only, due to having been seared from the sun's heat, when cut open was very fresh in both colour and smell, and was quite edible.

If the present intention to issue freshly killed beef is to be put in operation, this solution will be invaluable to me. I have had no occasion to use the solution on frozen meat only having used the preparation as a straight disinfectant in the butchery where I find it certainly purifies the air, and takes away any odour there may be

I find it very good for removing the odour arising when mutton has been hanging any length of time.

To—Major , London

Personal.

Remarks by the Supply Officer above in connection with the test made of Milton at the Supply Depot of this Station are forwarded please. I might mention what I saw of one or two demonstrations made by Mr Smith, it could be used to a very great advantage for many purposes, both in the Supplies and the Transport Sections of the C. A. S. C. It is by far the best disinfectant I have as yet seen and in view of the fact that fresh meat issues are about to be made, the butcher's shop is going to be not very far short of a slaughter house, and as a disinfectant and fly exterminator for this particular purpose I would strongly recommend the purchase of Milton in this connection

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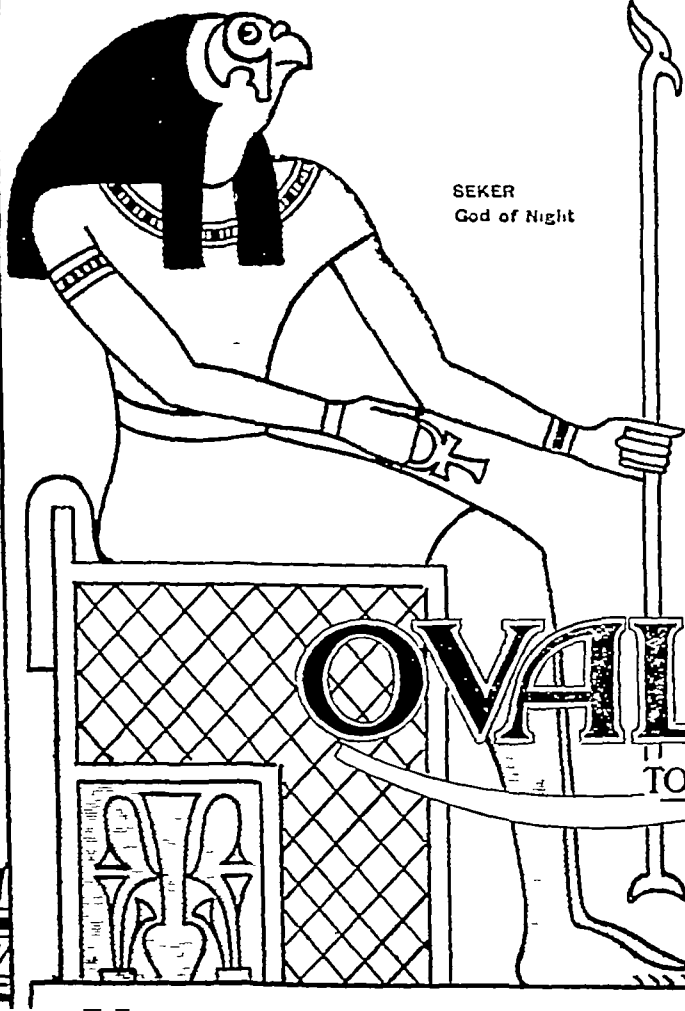
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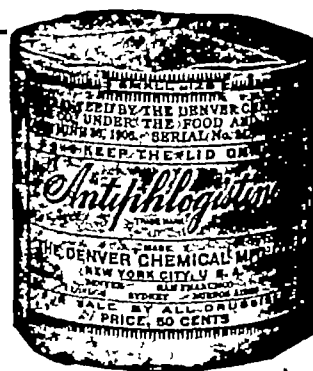
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Municipal Office,
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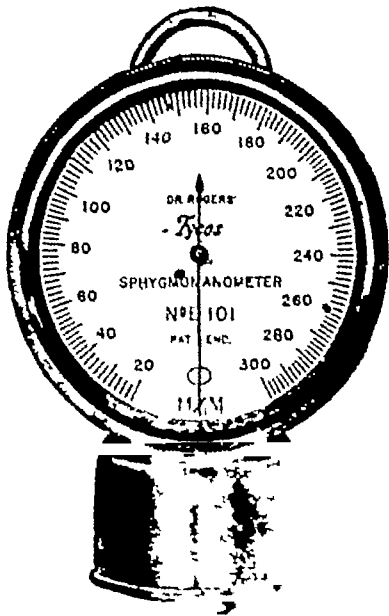
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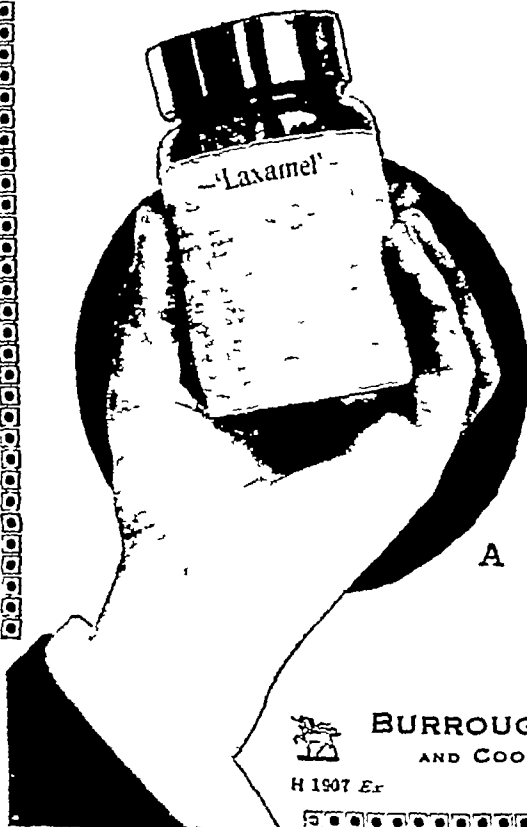

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Original Articles.

A NEWER INTERPRETATION OF THE PATHOGENESIS PROPHYLAXIS AND TREATMENT OF INFLUENZA

By CHARLES L. DE M. SAJOUS, M.D., LL.D.
S.D. (Philadelphia),

Professor of Therapeutics in the Temple University
Medical School. Late President of the
American Therapeutic Society

THE mortality of the 1918 pandemic which has been estimated at ten millions, and to which British India alone contributed five millions, according to the report of the British Research Commission prompted the preparation of the present paper in the hope that it might serve to mitigate somewhat the effects of the outbreak at Simla to which the London *Lancet* of June 12th, 1920, refers in the following words:

With the sudden advent of warmer weather, influenza, which has been smouldering for some time past has now broken out somewhat acutely. The Indian quarters are most affected. Influenza has appeared also in the neighbouring States, where the mortality rate is considerable. The local authorities have issued a notice inviting attention to methods of prophylaxis."

It is now generally conceded that despite the enormous labour devoted to all subdivisions of influenza, its bacteriology, pathogenesis, pathology and treatment are admittedly in a deplorable state. It was thought after the great pandemic of 1889, and Pfeiffer's labours in 1892 that mastery of the disease was near at hand. The B influenza, however, has increasingly lost its claim to recognition, while filtrable viruses and other uncertain pathogenic agents promise only, so far, a certainty of time-consuming labours, many years probably, while the disease is starting anew its destructive work.

A comprehensive study of the whole question including the epidemics of 1889-90 and 1918 and the recent recrudescence, as basis for clinical experience, led me to conclude not only that we had been working on misleading lines, but that the filtrable virus and other pathogenic factors now in course of investigation would prove quite as disappointing. The study referred to was read on March 16th, 1920, before the Medical Society of the County of Kings, Brooklyn, and published in the *New York Medical Journal* of May 15th, 1920 to which the reader is referred for details, the purpose of this article being only, owing to the urgency of the moment, to review those features of the research, and additional laboratory results obtained since, which will illustrate the need of the prophylactic and therapeutic measures advocated.

The investigations referred to showed that Pfeiffer bacillus was the true pathogenic organism of influenza, but that it did not act in accord

with Koch's postulates. I found that it was in the pulmonary alveoli, which present all conditions for the growth of the Pfeiffer bacillus—hemoglobin, oxygen and temperature—that its colonies were developed precisely as they are in the laboratory, and that these colonies caused therein lesions which led me to identify the disease as a *pulmonary necrotic alveolitis*. That these air vesicles are deeply involved is well shown post-mortem. Dr F. P. McNamara, for instance, who described ninety-five autopsies at the U. S. General Hospital No. 6 by Prof. Winternitz of Yale, (1) wrote "The most striking picture and one that is peculiar to this disease is the hyaline necrosis involving only the terminal bronchioles and alveolar walls." The cyanosis upon which so many internists lay stress, and so intense in some cases in my service in the Emergency Hospital No. 2 during the 1918 epidemic as to give the body a bluish black colour, point clearly also to an asphyctic condition which widespread destruction of the air vesicles clearly explains.

Further study then showed that we were protected to a degree at first estimated at 60 per cent and then (in a requested report to the French Government June 3rd, 1920) at 80 per cent, after revision of data, by the nasopharyngeal defences and the ciliated epithelium of the respiratory tract down to the terminal lobules. So perfect is this nasopharyngeal barrier that moderately contaminated air is found completely sterilized after passing through it. This explains the negative results obtained by practically all investigators who have attempted to provoke the disease by injecting B influenza into the nasal cavities. The germs were destroyed by phagocytes (the cytoplasm of which can be found to contain them) and the mucus of the respiratory passages long before they could reach the alveoli, which alone in the whole tract afforded the conditions necessary for their growth.

The strength of this conception is sustained not only by direct and well established evidence recorded by others besides my own, but also by the ease with which it solves many riddles that older conceptions have failed totally to meet. As instances I might mention the familiar fact that young men between twenty and thirty years are by far the preferred victims. This is readily explained when we take into account their powerful respiratory activity which causes air contaminated with the Pfeiffer bacillus to reach the alveoli rapidly, i.e. before sterilization of the air can have been completed in their respiratory passages. Again we know that leaving the sick bed too soon is usually followed by another and often fatal attack of the disease. With numerous alveoli as the seat of active colonies, perfect quiet in bed, by ensuring slow respiration, enables the expired air to be sterilized. If, conversely, the patient arises too soon the increased respiratory activity prevents complete sterilization of the expired current and the inspired current thus

carries active germs back to many previously unharmed alveoli, thus starting the disease anew—a true auto-infection

It accounts also for many previously unexplained clinical phenomena, *e.g.*, for the cyanosis, sometimes intense, by the interference with oxygenation of the blood precisely where this process is carried out, the alveoli, also for the early high temperature with relatively low pulse thus shown not to be a true fever, but the result of a passive dilatation (asphyctic relaxation) of the peripheral arterioles, thus permitting the admission of blood of higher temperature (103° to 105° F) from the deeper organs into the cutaneous vessels, also for the typical leucopenia due to the deficient metabolism in the leucocytogenic tissues incident upon the general cyanosis, also for the so-called apyretic cases in which the sensation of cold is due to cyanotic blood, also for the vulnerability to complications, the production of protective antibodies being inhibited by deficient oxygenation of all tissues, also for the formation of methemoglobin, deficient oxygenation of the blood causing the hemoglobin to be so reduced by the tissues as to cause it to break down, also for the occurrence of the various forms, abdominal, nervous, asphyctic, aural, etc., the general vasodilation and inadequate defensive efficiency resulting from deficient oxygenation and metabolism, causing any region predisposed to disease to become the prey of any bacteria it may contain, also for the somnolence suggesting "sleeping sickness," etc., when marked, due to the same asphyctic condition of the brain, also for the intense lassitude and myasthenia persisting long into convalescence due likewise to deficient tissue oxygenation and slowed metabolism, finally, for the short-lived immunity conferred on some subjects, the respiratory tract retaining for a short time the exacerbation of defensive activity initiated by the invasion of pathogenic germs

Prophylaxis—The foregoing remarks have pointedly indicated where protection against infection is paramount, *i.e.*, the respiratory tract. This is so well established that, as is well known, antiseptic sprays, gargles, fumes and douches are employed by most clinicians. But is it as antiseptics that they act? The recent war has taught us an important lesson in this connection: it was found that antiseptics, including the newer ones, in solutions sufficiently strong to kill bacteria also killed tissue cells. In the nasopharyngeal passages, therefore, if antiseptic solutions are too weak they are useless, if strong enough to destroy bacteria they do harm by inhibiting the local protective functions. Other data showed, however (particularly Lambert's experiments), that while iodine was very active as a sterilizer in a 1-2000 solution, it promoted cellular activity. Pharmacology also teaches that iodine is the specific excitant of lymphoid tissues and therefore of phagocytosis.

It was also observed during the war that in

toxic gas manufacturing plants, in which emanations of irritating gases, chlorine, sulphur dioxide, etc (not phosgene) in hardly perceptible proportions, permeated the air, immunity was conferred upon workers therein while influenza reigned unchecked in the neighbourhood Shuffelbotham (2), who investigated this report in England, found that workmen actually enjoyed a "very high degree of immunity from infection." A Gregor (3) ascertained bacteriologically that workers so exposed showed a marked decrease in the pharyngeal flora even twenty-four hours after exposure to the fumes. Tweddell (4) has observed similar protection at the Edgemont Arsenal in this country. Consular reports (5) from Germany had also called attention to the protective influence of evaporating turpentine in workmen during an epidemic.

All the practical phases of the question, clinical, experimental and industrial, unite, therefore, in pointing to the value of measures which enhance the defensive efficiency of the respiratory tract as the foundation of our prophylactic measures. Normally, as previously stated, its tissues defend us to the extent perhaps of 80 per cent. It is the remaining 20 per cent of defensive efficiency that we should aim to promote to obtain complete protection. How may we secure it?

We have seen that iodine is superior to any of the antiseptics used because, while provoking a local defensive reaction, it favours the vital activity of the lymphoid and epithelial cells. Yet, it must be employed with due care, as shown below.

Luckhardt, Koch, Schroeder and Weiland (6) have recently emphasized the dangers attending the direct application of iodine fumes obtained from crystals by heat as recommended by some authors for the treatment of diseases of the respiratory tract. This corresponds precisely with my own experience. Personal tests showed that even as weak a solution of iodine as 1 to 2000 caused too much smarting when sprayed into the nasal cavities to be employed, but that when iodine crystals were slowly converted into fumes by the heat of a small alcohol lamp 15 centimetres below them, and mixed with air in the proportion of 0.33 gramme of crystals to 16 cubic metres of air (the size of a very small room used as inhalatorium), the iodized air could be inhaled comfortably. Any stronger dilution caused a symptom which indicates that the proportion of iodine is too great, *viz.*, *persistent smarting of the conjunctiva* after the first slight pricking sensation experienced on entering the iodized air chamber. This affords a delicate test for the adjustment of the mixture to proper proportions by the admission of additional air into the room.

The duration of the slight pungency experienced in the upper respiratory tract, beginning with a sensation of dryness and followed by a freer flow of mucus, obtained with 5 grains of

crystals, was about one hour. It was found, however, that these effects could be perpetuated indefinitely by dropping tincture of iodine upon the small receptacle over the alcohol flame which had held the crystals, at the rate of four drops a minute or one-half ounce an hour. The fumes thus formed were inhaled hour after hour without difficulty or causing irritation, although starch held over the heated iodine tincture showed distinctly by turning blue that the halogen was being vaporized, while the odour of the air of the inhalatorium to those entering from the outside was characteristic.

The effects of a stay of but three hours in the inhalatorium so charged were unexpectedly prolonged. Although no deep breaths had been taken the odour of iodine *per se* (different somewhat from that of the tincture itself) was perceptible the whole of the following day off and on, that is to say about thirty-two hours. This accounts for the fact that Gregor(7) had found that the nasopharyngeal organisms of the workmen exposed to chlorine and other fumes were markedly decreased as much as twenty-four hours after leaving their plants. When we consider the superiority of iodine fumes over those to which they were exposed, and also the relative vulnerability of the B influenzae, there is every reason to believe—pending bacteriological investigations which could not be satisfactorily carried out before this paper was mailed to Calcutta—that three hours of exposure to iodine fumes under the conditions mentioned would afford at least protection for an additional five hours, during an epidemic by enhancing the defensive efficiency of the whole respiratory tract.

The practical bearing of these observations is that all public places, schools, places of amusement, shops, hotels, churches, offices, factories, barracks, hospitals, etc., where many people spend much time either as pupils, employees, visitors, etc. and which are now foci of infection, could be converted into as many *sterilizing and immunizing inhalatoria* provided the air in them be kept iodized in the proportion above mentioned, by multiplying as needed and distributing evenly throughout the area to be iodized, what apparatus—very simple and inexpensive as we shall see—may be needed for that area. Or, better, where a suitably situated adjoining room is available, fresh air from an open window may be strongly iodized, and driven by a turbine or rotatory fans through an enclosed shaft to the occupied room, and in such proportions as to insure the dilution specified. The iodized air can thus be kept pure, escape vents being supplied through lowered upper sashes, or transoms for the escape of the air from the occupied quarters.

During the hours all such places would be used (say three hours), all those exposed to the iodized air would, estimating very conservatively, be protected five hours besides, thus aggregating eight hours, at least until bed time. If the

subjects happen to spend the evening in a place of amusement, church, etc., or any other sterilizing inhalatoria, the protection would extend to the following morning. Yet, absolute safety imposes the need of an iodized air apparatus in every home, thus perpetuating its effects throughout the twenty-four hours.

To provide for out-of-door workers, labourers, masons, bricklayers, drivers, street vendors, etc., *sterilizing tents* might be provided, but here again the need of an apparatus at home imposes itself, since workers would hardly consent to spend the time necessary during the day, even to protect themselves. Indeed, the more the question is studied the more it becomes plain that all residences, great and small, the palace down to the hovel, should, if legally possible, be made by the municipal authorities and under their watchful eyes, to be kept iodized, and, if possible at the expense of the commonwealth, to insure execution. This alone would ensure complete protection.

The cost of adequate protection can be made comparatively slight if it is realized that expensive apparatus is quite unnecessary. Among the poor whose living quarters are small, what lighting, heating or cooking facilities they possess may be utilized with the aid of slight ingenuity. A small open box—a 100-cigar box, for instance—may be used, by removing one of its ends and replacing the latter by a piece of wire netting. This netting is used, the box standing on its other end, to support a small metallic cover or saucer, in which are placed the iodine crystals. These, in turn—or the drops of tincture of iodine—are gradually evaporated by the flame of a small alcohol lamp placed on the floor of the upright box. The three walls of which prevent side draughts from disturbing the flame while forming a chamber of warmed air which propels the iodine fumes upward and disseminates them. The same box can be used for the evaporation of the tincture of iodine drops, by nailing to it an elbow support for a glass funnel the beak of which contains a stopper provided with a small hole so regulated as to allow the tincture of iodine it holds to drop on the evaporating plate as needed.

Where such comprehensive measures cannot be carried out a *small inhaler* calculated to permit the inhalation of *cold* iodine emanations, which are far less dense than the fumes evolved by heat, can be used. It consists merely of a glass tube one end of which is enlarged into a bulb calculated to fit into either nostril. Each end is packed though not tightly, with a wad of cotton wool. Three grains of iodine crystals being placed between the two wads, *i.e.*, in the middle of the inhaler. One end of the latter being enlarged and bulb shaped, the bulb is introduced into each nostril in turn. On inhaling slowly but steadily through it, the iodine emanation will be felt to penetrate far down. To insure filling the entire bronchial tree down to the alveoli after removing the inhaler, the nose is closed

with the fingers, and efforts to blow the iodine out through the nose, the mouth being shut, are made. The slight warmth and pricking sensation experienced in the nose and throat disappears in a few minutes. Not more than two inhalations from the inhaler should be taken. These suffice, after clearing the nose, to excite a defensive reaction which may be sustained if the procedure is repeated several times a day. Various pocket inhalers available in the shops may be used for the same purpose, but, in an emergency, I found that discarded vaccine tubes served the purpose very well.

Such an inhaler is particularly useful where the air is likely to be contaminated, in tramways, places of amusement, shops, etc. As stated elsewhere (8), it should be used before leaving home and every three hours to keep the nasal mucosa on the defensive. At present, coughing and sneezing individuals are urged to cover their faces, nose and mouth with their handkerchiefs, but everyone exposed should likewise protect himself with his handkerchief. A small inhaler hidden in it, and used, materially reduces the danger of infection. A few whiffs suffice. Again, many bacteria inhaled are present at first in the anterior nasal cavities, if the inhaler is used again on reaching home, and the nose freely blown, additional protection is afforded. Although the January-February (1920) epidemic afforded ground for the belief that this measure affords protection, thousands of cases can alone determine its value. *A priori*, however, it is obvious that the general public measures advocated in the foregoing pages offer a far greater opportunity for adequate protection than the desultory use of any inhaler.

Oil of turpentine, though far less efficient than iodine, might prove useful in the absence of the latter. It may be used in the same three ways, but its odour is unpleasant to most people. *Terebene*, *terpene hydrate* and *pine needle oil* are most pleasant, but also more expensive and less efficient than iodine. All are also evaporated by heat, but they should be floated on heated water. Public places, homes, vehicles, etc., may be used as inhalatoria, as in Europe, their atmosphere being heavily loaded with one or several essential oils. *Oil of eucalyptus* is also useful, but not as active a stimulant of the respiratory mucosa. One-half each of the *oils of turpentine* and *eucalyptol*, dropped on the cotton of a pocket inhaler, used frequently during the day, are stimulating to the respiratory passages, but not to the same degree as iodine.

In hospitals, respirators on the Yeo principle could be used with *terebene* as the excitant, the continuous use and close proximity to the respiratory tract requiring a less irritating agent. Or, if the mask be used, it may be dropped on it opposite the nostrils.

The masks used in the United States, during the 1918 epidemic, even those made of four-ply gauze, were defective in that they allowed germs deposited on their surface, and when dried, to

be drawn into the nasal cavities, with the inspired air. A bit of snuff placed on the mask opposite the nostrils, when in position, or work where coal dust permeates the air, will soon illustrate this fact, when the wearer is subjected to exertion. Again, the stifling caused by four-ply gauze against the nostrils caused the mask to be removed, often without pretext, particularly by nurses.

Study of this whole question showed that these drawbacks could be avoided by means of a newer model—a boat-like hood made of canvas which covers the nose and mouth, though not in contact with them, each side being extended by flaps made of two-ply cheese cloth provided with tapes for attachment behind the head. The wearer breathes without discomfort, the air circulating in and out from the side only. The boat-like hood covering the nose and mouth being absolutely impermeable, it prevents all access to the nose or throat of bacteria-laden droplets even if they are coughed directly into the face. The few striking the sides having to travel a circuitous route cannot reach the nasal cavities, even aided by the inspiratory suction, with sufficient velocity to reach beyond the nasopharyngeal barriers, where they would be promptly destroyed, long before, therefore, having reached even the bronchial tract.

Important in this connection is the fact that the velocity with which contaminated air is inhaled determines whether infection will occur or not. The great prevalence of the disease among young men, as we have seen, is explained by their great chest vigour. Hence the danger of any violent exertion during an epidemic, dancing, skating, drilling (as personally observed in my command) and other sources of unusual activity, the aim being to prevent the B influenza from reaching the alveoli.

Cold quarters, apartments, rooms, etc., favour infecting by lowering the activity of the defensive ferments of the respiratory tract. Living quarters should not be allowed to reach below 65° F during an epidemic though well ventilated.

Treatment—Anyone showing a rise of temperature and other symptoms of influenza during an epidemic should at once be kept in bed, isolated, reported, and the room at least placarded. Agar plates and smears of the nasopharyngeal mucus should then determine the presence or absence of disease. In the meantime, a light calomel purge, a grain in divided doses, followed by a mild saline aperient, should be given. I have pointed out (9) that mercury is probably our most energetic stimulant of defensive function.

The room, preferably a small one, should be iodized (though not sufficiently so to prove irritating to the eyes) with iodine fumes generated near the patient's bed. The aim should be to check the formation of colonies in the alveoli and to destroy the influenza bacilli in the respiratory tract at the earliest possible moment, the bacilli from the alveolar colonies serving to infect other alveoli. The iodine fumes would

also protect the nurse as they readily penetrate the sides of the mask. The latter should always be worn by her in the patient's room, not only to protect her but also to prevent her becoming a carrier.

A bed-tent, the upper part of which would reach above a window, with the upper sash somewhat lowered, would serve to concentrate the fumes in a small area and increase their efficiency. The patient, however, should be kept warm, though kept supplied with fresh air. The small inhaling tube might be used if the air cannot be iodized satisfactorily.

In children, in whom the iodine inhaler cannot be used, steam inhalations composed of *menthol* $\frac{1}{2}$ dram and *fluid extract of eucalyptus* 2 ounces, one teaspoonful to a pint of hot water, are efficient, being both stimulating and antiseptic, but not sufficiently so to harm the tissues. The ubiquitous sweet spirit of nitre should not be used, all nitrites serving to dilate the arterioles, thus aggravating one of the evil effects of the disease, that to which the cyanosis is partly due.

Conversely, the *salicylates* have wrongly been abandoned on the plea that they caused cyanosis—a criticism which applies only to excessive doses—whereas this symptom, we have seen, is due to the disease itself. In 1907 (10), I urged that in small therapeutic doses the salicylates caused constriction of the arterioles and reduced the volume of blood supplied to all tissues including the painful areas. It is precisely through this action that they reduce the so-called "fever" of influenza, which is not a true fever, but the result of flooding of the cutaneous capillaries resulting from the influenzal dilatation of these arterioles. They also relieve, by the same process, the racking headache and the so-called temperature, the myalgia and other characteristic discomforts, by causing the capillaries to resume more or less their normal caliber. This applies to all organs, which are the seat, as necroses show, of marked congestion, including, particularly those that suffer most, the lungs (assailed directly by the B influenzae in their alveoli and indirectly by the passive congestion of their immense capillary system) and also the adrenals. Indeed, interpreted in the light of my views, it would be difficult to find a more perfect specific than the salicylates. An essential feature of these agents, however, is that they should be used in *small* doses, since large doses, by aggravating the constriction of the arterioles, produce asphyctic effects on the tissues resembling those due to influenza.

The *ammonium salicylate* is the best salt to use since it tends also to reduce the acidosis, 10 grains at one dose, followed by 5 grains every two hours, has given me the best results. Or, *salicin*, in 10-grain doses every hour, four times, then every two hours, is equally helpful. The reduction of the so-called "fever" is promptly effected and the suffering is controlled even more rapidly by injecting intravenously, but slowly, 5 to 7 grains of *sodium salicylate*

dissolved in 30 m in the twenty-four

Of the coal-tars, on the arterioles but acetanilid are too perhaps, for a while, in small doses, causing depression. *Acetphenetidin*, *sodium bicarbonate* 10 grains, does not seem to possess these very helpful when the salicylates obtained. *Hocoin*, which includes vasoconstriction among its effects, is when the suffering, including the dyspnea, edema, resists the foregoing agents.

When the circulatory equilibrium has been established by the use of the salicylates or its congeners, i. e., when the peripheral hyperemia or so-called fever has abated, thus indicating that the adrenals are no longer the seat of passive congestion, *strychnin*, which, as I urged in 1903 and 1907, and recently confirmed by Stewart and Rogoff, stimulates the adrenals, should be used to keep the arterioles contracted, a function of those organs. One of my pupils and former laboratory assistant, Dr. V. P. Jourdan, of Bristol, Pa., found in a series of 750 cases, including 46 with marked pulmonary complications and a total mortality of but 8 cases, that small doses were futile (a logical conclusion in view of the torpor of all centers due to the general asphyctic trend) and that 1/30 grain doses increased to 1/20 grain four times a day, or 1/15 grain twice daily, were necessary to obtain good results. When pulmonary edema is present, *strychnin* is contraindicated, the resulting rise of blood-pressure tending to aggravate it.

The adrenal insufficiency upon which French clinicians first laid considerable stress and which several American internists have now confirmed, we have seen, has led to the use of *adrenalin*—in most instances with excellent results, but in a few with no benefit. Its use, 10 to 15 minims of the 1-1000 solution in 30 minims of saline solution, injected slowly intramuscularly, is subject to the same rule as *strychnin* in so far as peripheral hyperthermia ("fever") is concerned, when it should not be used, but it does not tend with the small doses employed, like *strychnin* to increase pulmonary edema, and may then be helpful.

An auxiliary measure of material help in these cases, and calculated to offset both the marked acidosis and also the viscosity of the blood, is a pleasant beverage composed of one-half each of *milk* and *saline solution*, and one dram of *sodium bicarbonate* to the pint. One tumblerful every four hours, besides promoting general osmosis, insures free renal action, thus facilitating the elimination of toxic wastes. Rectal injections of warm saline solution are preferable to cathartics to keep the bowels open.

No patient should be allowed to leave his bed until agar plates and smears of his

with pharyngeal and tracheal mucus demonstrate out no active colonies exist in his alveoli. This male precaution is suggested for the examination of possible carriers from infected districts for the protection of municipalities.

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A PRELIMINARY REPORT ON THE MINIMUM CURATIVE DOSE OF QUININE IN THE TREATMENT OF MALARIAL FEVER BY THE INTRAVENOUS METHOD

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THE duration of treatment of malarial fever by quinine is still a matter for discussion and different authorities give different opinions on the subject. Castellani and Chalmers state that their "routine practice has been to continue with 10 grains three times a day for a month after the cessation of the fever, 5 grains three times a day during the second month, then 5 grains twice a day during the third month." In the treatment of malarial fever by the intravenous injection of quinine, a method which one sometimes adopts in cases suffering from recurring attacks, the physician has to decide when there has been complete sterilization of the system. Negative results on examination of the peripheral blood are of no help whatever, as it is a well-known fact that the parasites may remain in the internal organs during treatment with quinine, although the peripheral blood may not show the parasites. The complement-fixation test recently introduced by Gordon Thomson of the London School of Tropical Medicine may, when perfected, tell us whether and when a malarial infection has died out, but the test is very technical, and as yet is subject to great error, clinical observations have, therefore, to be depended upon. In the following cases are recorded my experiences of the minimum doses required to bring about complete sterilization, being based on the subsequent history of the patient kept under my observation. Such observations are frequently not free from errors, as re-infection is likely to take place and the only way to be absolutely certain about one's

results is to keep the patient in hospital for prolonged periods where the chances of re-infection are slight or non-existent.

It is in this way one can determine what I have termed *the minimum curative dose of quinine in the treatment of malarial fever by the intravenous method*. In the following cases, I have tried to determine this, though in all of them, I could not keep the patients in hospital for indefinite periods.

1 Patient, named *Nirmal*, was admitted into my ward on 10-7-19 with a history of recurring attacks of fever coming on every fourth day for three months. The spleen was enlarged, extending 2" below the costal margin. The blood showed the presence of quartan parasites.

Treatment—10 grains of quinine were given intravenously from 10-7-19 for seven successive days.

Result—Patient free from fever for more than a year. She is still in hospital free from fever. No parasites could be found in the peripheral blood on repeated examination. On 15-8-20 no parasite was found on spleen puncture, *i.e.*, nearly one year after completion of treatment.

Conclusion—The parasites have been completely destroyed, and patient completely cured.

2 *Ellen*—Patient was admitted into my ward on 30-1-19. He gave a history of recurring attacks of fever coming on every fourth day. He contracted the disease in Assam and had been suffering for more than six months. The blood showed quartan parasites. Spleen extended 4½" below the costal arch. (See Temp Chart I.)

Treatment—(1) 5 grains of quinine given intravenously on 2-2-19, three hours before the expected paroxysm. Fever recurred on 5-2-19.

(2) 10 grains of quinine given intravenously on the expected days of a paroxysm, three hours before the expected attack, *i.e.* on (1) 8-2-19, (2) 11-2-19, (3) 14-2-19, (4) 17-2-19, (5) 20-2-19, (6) 23-2-19, (7) 26-2-19.

Result—No recurrence since. Patient remained free from fever for two months in hospital after the second course of treatment and has been reported free from fever since, *i.e.*, for more than a year and-a-half.

Conclusion—The parasites have been completely destroyed, and patient completely cured.

3 *Annoda*—Patient was admitted into my ward on 6-1-19. He gave a history of recurring attacks of fever for three months. Blood showed the presence of benign tertian parasites. Spleen extended 2" below costal arch. (See Temp Chart II.)

(1) 5 grains of quinine given intravenously on 9-1-19.

Fever recurred on 2-2-19 (parasites in blood)

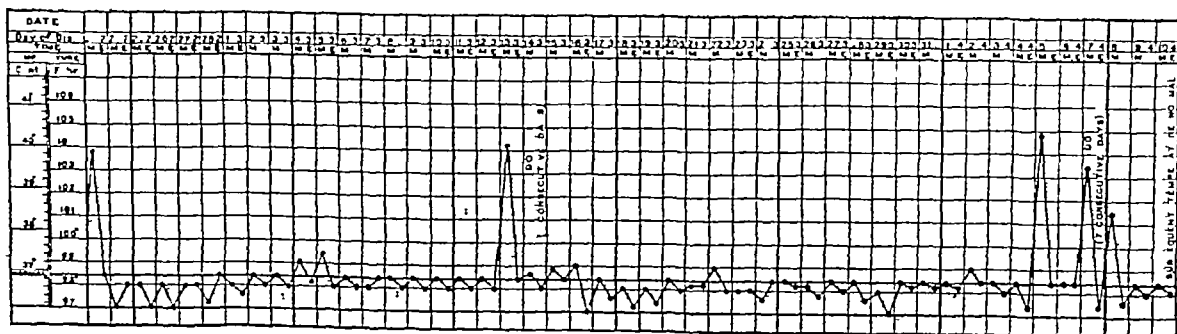
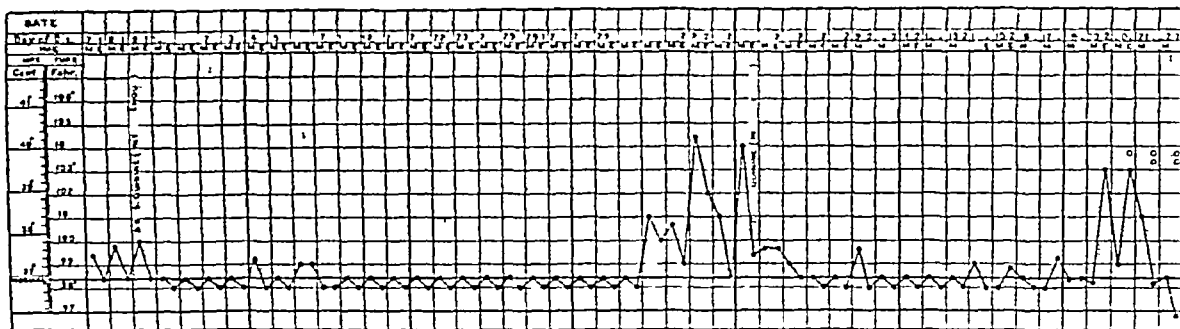
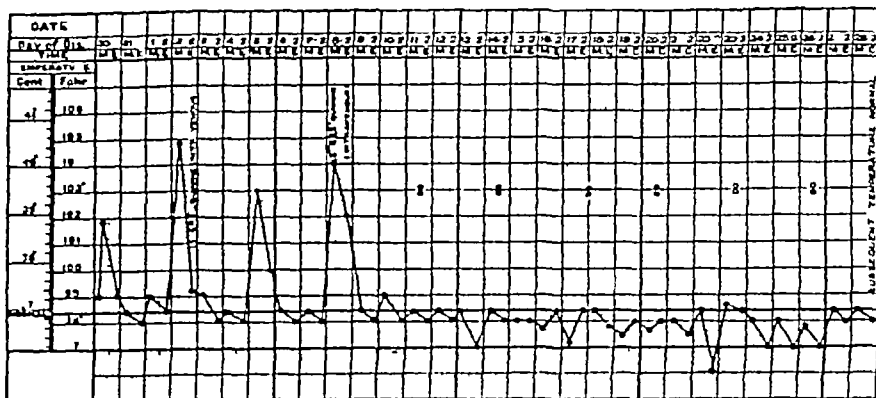
(2) 10 grains of quinine given intravenously on 4-2-19.

Fever recurred on 12-2-19 (parasites found)

(3) 10 grains of quinine given intravenously on 20-2-19 and three consecutive days.

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Fever recurred on 13-3-19 (parasites found)
(4) 10 grains of quinine given intravenously on 14-3-19 and four consecutive days

Fever recurred on 5-4-19 (parasites found)
(5) 10 grains of quinine given intravenously on 7-4-19 and six consecutive days

Result—No recurrence after the last treatment with quinine. Patient remained in hospital for 6 months since the last injection

Conclusion—The parasites have been completely destroyed, and patient completely cured

4 *Kangli*—Patient was admitted into my ward on 24-3-19. He gave a history of recurring attacks of fever for four months. Blood showed the presence of benign tertian parasites. Spleen extended 2" below costal arch. (See Temp Chart III)

(1) 10 grains of quinine given intravenously on 15-3-19

Fever persistent (parasites present)

(2) 10 grains on 18-3-19 for five consecutive days

Fever persistent (parasites present, but very few)

(3) 10 grains from 29-3-19 for seven consecutive days

Patient free from fever since the last injection. Patient remained in hospital for two months free from fever, and has reported since to have had no recurrence up to now, which is nearly a year and-a-half after the treatment was concluded

Conclusion—The parasites have been completely destroyed, and patient completely cured

5 *Khurshed*—Patient was admitted into my ward on 26-4-19. The blood showed the presence of benign tertian parasites. Spleen extended 2" below the costal arch. He gave a history of recurring attacks of fever for two months

(1) 10 grains of quinine given intravenously on 5-5-19 and on 10-5-19

Fever recurred on 20-5-19 (presence of parasites)

(2) 10 grains of quinine given intravenously from 20-5-19 for seven consecutive days

Result—Patient free from fever since the last injection. Was in hospital for nearly two months after being free from fever

No conclusion can be drawn from the case, as patient was under observation for only two months

6 *Purna*—Patient was admitted into my ward on 19-6-19. The blood showed the presence of benign tertian parasites. He gave history of recurring attacks of fever. (See Temp Chart IV)

(1) Six grains of quinine given intravenously from 25-6-19 for three consecutive days

Fever recurred on 14-7-19 (parasites present)

(2) 10 grains of quinine given from 16-7-19 for seven consecutive days

Result—Patient has remained free from fever since the last injection

No recurrence for six months, after which patient could not be traced

Conclusion—Parasites completely destroyed, and patient completely cured

7 *Maditar*—Patient was admitted into my ward on 3-6-19. He gave a history of recurring attacks of fever. Blood showed the presence of benign tertian parasites. Spleen extended 2" below costal arch

(1) 10 grains of quinine given intravenously from 16-6-19 for five consecutive days

Fever recurred on 2-7-20 (See Temp Chart V)

(2) 10 grains of quinine given intravenously on 3-7-20 for seven consecutive days

Result—Patient had no fever since the last injection. He was in hospital for nearly three months free from fever

In all the above cases, no parasites could be detected on repeated examination of the blood after the treatment was completed

8 *Laha Singh*—Patient was admitted into my ward on 15-6-19. Blood showed the presence of malignant tertian parasites with crescents

(1) 10 grains of quinine given on 22-6-19 and 23-6-19

Fever relapsed on 3-7-19

(2) 10 grains of quinine given from 3-7-19 for seven consecutive days

Result—The patient had no fever since the last injection. He was in hospital for nearly two months after the last injection during which time he was free from fever. Subsequent history of the patient could not be traced

From the above cases the following conclusions may be drawn—

(1) In recurring benign tertian infections, 10 grains of quinine must be given intravenously for, at least, seven successive days to bring about complete sterilization

(2) In recurring quartan infections, 10 grains of quinine must be given intravenously for, at least, seven days to bring about complete sterilization. In one case complete sterilization was brought about by giving the injections on the expected days of the paroxysm, and in another case by giving the injections for seven successive days

(3) The reason why several intravenous injections of quinine have to be given to bring about complete sterilization can be explained by the fact that quinine is quickly eliminated by the kidneys after intravenous injection and the whole of it may be excreted before all the parasites have been destroyed

I cannot agree with Col A G Phear, who, in a lecture at a meeting of the Royal Society of Medicine held in March, 1920, stated that it was impossible to eradicate the malarial parasite from the system in cases of relapsing malaria by any known method of treatment, including the administration of quinine

It will be seen from the above that though my observations are limited, yet so far they

differ from those of Stephens and his colleagues, who consider that intravenous injections of quinine effect only a temporary cure of simple tertian malarial fever and cannot prevent relapses. It is, however, quite possible, as has been observed by James, that in *some* cases intravenous injection of quinine may fail to prevent the occurrence of relapses, and such cases will form the subject of future investigations. I would also point out that, according to some, it is possible that in the blood vascular system there are regions that are consistently free from quinine throughout a period of quinine treatment.

SURGICAL TUBERCULOSIS

By DR BHUPAL SINGH, B.A., M.B.

[A paper read before the Medical Association, Meerut.]

By "Surgical Tuberculosis" I mean those manifestations of the tubercle bacillus in the human body that are amenable to known surgical methods of treatment, for instance—

Tubercular adenitis—Cervical, axillary, mesenteric

Tubercular disease of joints—Hip, knee, elbow, etc

Tubercular caries of bone—Caries of rib, sternum, spine, ilium, carpus, metacarpus, phalanges of fingers, tarsus, metatarsus, and phalanges of toes

Tubercular affections of the skin—Such as lupus

Tubercular disease of membranes—Such as pleurisy, peritonitis, and meningitis

Tubercular disease of certain organs—Such as the kidneys, testis, tonsils, larynx and even tubercle of lung, considering that the best treatment for it at one stage is surgical, I mean artificial pneumothorax.

Lastly, the so-called cold abscess—Either as a result of any of the above conditions, or intramuscular

The subject is very extensive indeed, including practically all the manifestations of the tubercle bacillus in the system.

My idea of tuberculosis is that it is a general disease, and its local manifestations depend upon lowered resistance of a particular part of the body to the tubercle bacilli at one time or another in the life of the individual.

Secondly, that infection takes place in childhood in a great majority of cases and may lie dormant in the system, perhaps in mesenteric, bronchial or cervical glands, to flare up and manifest itself in some part when its resistance is lowered due to one cause or another. Hamburger found as many as 94 per cent of children positive to tubercle bacillus as a result of the tuberculin test on Viennese children.

Thirdly, that the human system can deal with tuberculous infection successfully in some unknown way, as is proved by healed tuberculous lesions observed in post-mortem examinations in

a large number of cases. Reinhart of Berne found healed tuberculous lesions in as many as 96 per cent in a series of necropsies.

Fourthly, that we yet know no medicinal agent which has a specific effect in controlling the disease.

ÆTIOLOGY

Tuberculosis in general, and especially surgical tuberculosis, is a disease of childhood and early adolescence. Similar manifestations in advanced age are probably syphilitic. The infecting organism is the bovine type of tubercle bacillus in a majority of cases. The chief mode of infection is through the milk of tuberculous cows, when the infection may be carried to the mesenteric glands and lie dormant there. The infection may also take place through inhalation of infected material, and in this case the infection is either caught in the tonsils or throat and passes on to cervical glands, or through the lung tissue to the bronchial glands. Heredity does play a part in providing the child with a weak constitution, and the early environment of the child with the parents probably in the grip of active tuberculosis may have a very great effect indeed. It has to be admitted that tuberculosis is very much on the increase in India these days, and the chief cause of this has to be looked for in the miserable economic condition of the people of the middle class especially, who are underfed, have to live in overcrowded houses, and are broken down by worry consequent on the keen struggle for life. Our educational system with its lengthy curriculum of studies, leaving very little time for physical unfolding, and overburdening the undeveloped brains of the youth, has such a devitalising effect on the growing generation that it becomes an easy prey to all sorts of diseases. It will not be far wrong to say that every one of us is a potential case of tuberculosis, and our apparent freedom from the disease is simply due to our keeping our system, in a fit condition generally, and thus offering good resistance to the tubercle bacillus ready to attack any weak spot, such as a sprained joint, a contused bone, etc. I have read of a fine distinction being made between "tuberculous infection" and "tuberculous disease." As I mentioned before, as many as 94 per cent of children may have evidence of tuberculous infection, but only a small number of them may be suffering from tuberculous disease.

PATHOLOGY

In whatever tissue tubercle bacilli settle they set up a local irritation due to the special toxin—tuberculin—manufactured by them, resulting in the formation of small nodules called tubercles. These coalesce and form bigger nodules, even huge masses. These nodules soften at the centre, forming a cheesy material, and large collections of this cheesy material give rise to what is called a cold abscess. All this is a very chronic process indeed. In addition to these local changes, tuberculin produces certain

general effects due to its toxic effect on various organs, giving rise to emaciation, fever and cardiac and muscular weakness

SIGNS AND SYMPTOMS

These are general and local

(a) *General signs*—These are due to the absorption of tuberculin from the local focus. The patient looks run down, gets tired on slight exertion, has a poor appetite and feels heavy and disinclined for work after food. May have a slight rise of temperature in the afternoon. The pulse is rapid and of low tension. There is emaciation and progressive loss of weight.

(b) *Local signs*—These depend on the part affected. Formation of a swelling, which is at first hard, and then becomes soft and baggy with loss of function of the part affected, is a common feature.

i. *Tubercular adenitis*—The glands first appear as separate firm swellings, which are often due to caseation of the centre. These become matted together as a result of periadenitis. In the mesentery the glands may get very big and peritoneal adhesions forming about them may give rise to attacks of colic.

ii. *Tubercular disease of joints*—The first sign is spasm of the surrounding muscles which is simply a protective mechanism to prevent further injury to the synovial membrane. It may be called spasmodic ankylosis.

The second important and early sign is the special deformity produced by an effort on the part of the organism to put the joint in a state of rest, in which the ligaments of the joint are least tense. The hip is generally abducted and rotated outwards, the knee assumes a partially flexed condition, the ankle is in a state of plantar flexion with toes pointed, and the elbow is semi-flexed.

The third important sign is atrophy of the muscles in relation to the joint.

Pain is not a very important sign and may be referred to distant parts.

iii. *Tuberculous disease of bone*—Pain is a very important symptom and is generally worse at night.

In caries of spine the first sign is rigidity of the back, the patient bending and turning with special care. Neuralgic pains are referred along the spinal nerves. As the disease advances and the vertebræ get soft, characteristic deformity develops with separation of spinous processes, and retro-pharyngeal or ilio-psoas abscesses appear. In more advanced cases paralysis of the bladder and rectum and paraplegia may develop.

Caries of the tarsus is a very serious condition. The joint soon gets affected, baggy swelling and pain with special deformity (plantar flexion) are special signs.

iv. *Tuberculous pleurisy* is a common condition. It is, as a rule, serous, but in some cases may be purulent and gives rise to the usual signs.

Tubercular peritonitis is, as a rule, secondary to tubercular adenitis of mesenteric glands and

is a chronic process. In affection of the omentum a firm transverse band is a distinctive sign. Recurring attacks of colic due to interference with the peristaltic movements of the bowel are very common.

v. *Tuberculous disease of kidneys and ureters* shows chiefly by aching pain in the kidney region and passage of blood and pus in the urine in which the tubercle bacillus may be detected. There may be typical attacks of renal colic.

Tuberculous disease of the testis begins in the vas deferens as nodular swellings and then extends to the epididymis and the body of testis. The nodules may show a fluctuating centre and there may be a little fluid in the tunica vaginalis.

Tuberculosis of the larynx is a complication of phthisis and shows as small nodules or sloughing ulcers.

vi. *A cold abscess* is the result of softening of tubercular nodules without any signs of acute inflammation. It is a baggy fluctuating swelling, full of milky pus with shreds of cheesy material. The local signs are very misleading as to the extent of the abscess. A small swelling in the iliac region may mean a huge abscess full of seers of pus, from the dorsal spine down to the iliac region.

DIAGNOSIS

There is a great similarity between tuberculous and tertiary syphilitic lesions. The fact that tuberculous lesions are common in early life and syphilitic lesions are common in old age may help in the diagnosis. The Wassermann test for syphilis may be a negative evidence in favour of tuberculosis.

PROGNOSIS

Is very disappointing indeed. The disease being so insidious in its progress, the case is generally allowed to progress till it has resulted in extensive destruction of tissues. And we know of nothing which has a specific effect on the process. It is all very well to talk of fresh air, nutritious food, absolute rest and all that sort of thing in the distant hope of increasing the resisting power of the patient, but in most cases it becomes impossible to carry out such instructions and they end in being attractive theories.

Whenever the local focus of disease can be excised, the prognosis is very good—otherwise the prognosis is bad.

TREATMENT

I must admit I take up a case of tuberculosis in a pessimistic mood. I have seen a lot of operative work done for tuberculous lesions, and I have done a lot of it myself, but the results have been disappointing except where we have been able to excise the diseased part.

Just as on one side I shall strongly advocate radical measures in dealing with tuberculous lesions, on the other I shall just as strongly advocate judicious conservatism. I have seen a cold abscess opened in the out-patient department

without chloroform, with evacuation of a large amount of pus. It is a brilliant performance in the eyes of the patient, and even the surgeon seems to pride himself on it. But it is nothing short of criminal. The case makes good progress for a time with drainage provided for, but sooner or later sepsis supervenes and the result is disastrous. I have seen a lot of scraping done for tuberculous caries of bone, the results are very nice for a short time, but as the disease in the carious bone extends far beyond the soft scrapable bone the process goes on and the bone goes on gradually rotting away, and all we have effected has been the introduction of ordinary sepsis. I do not mean this as a special discredit to the surgeon. There are so many delicate details involved in the process of aseptic handling of wounds that it is an impossibility for the surgeon to look to every detail himself. On the other hand, I have also seen cases of caries of elbow ultimately sacrificed to the conservative fad of some surgeons or to the obstinacy of some patients in refusing to submit to an amputation when others gave them hope by "scraping." I cannot condemn this process of scraping too strongly. It has no place in the surgery of tuberculous disease of bone, and is responsible for so much havoc that we as surgeons cause to the unfortunate tuberculous patient. It has a slight utility in lesions involving soft parts only, but even here I would advocate excision in preference to it.

As I said before, tuberculosis is a general disease, and its treatment also is firstly general and then local.

(a) *General treatment*—We know nature heals up tuberculous foci by encapsulation or fibrosis, but we do not know how we can help nature in this work. The general treatment should aim at improving the general health of the individual so that his resisting power to any infection may be increased. This is best effected by providing him with as much fresh air as possible—nutritious food, eggs, milk, butter, cream, soups, etc., and freedom from worry. This last, which is so often neglected, is more important than fresh air and good food. These will have no effect in the presence of worry, and unfortunately as doctors we seem to forget that our unfortunate patient possesses a mind.

As regards medicines which we may use to improve the general condition of the patient, an acid stomachic tonic with nux vomica is the best—cod-liver oil and malt are nourishing foods. Another medicine I have a great faith in is calcium, I have an idea that it helps in the encapsulation of tubercular foci.

Then there are certain special medicines which we may use to increase the resisting power of the individual to tubercular infection, especially tuberculin and sodium morrhuate. I have used tuberculin with very good immediate result in tubercular adenitis, but the effect has been temporary. I have also used sodium morrhuate in a few cases, but except for a little

general improvement I have not found it useful, but I have not yet been able to give it a sufficient trial.

(b) *Local treatment*—It depends on the part affected but after personal experience, I have formulated certain general principles for my guidance, and these are—

1 Absolute rest to the part affected by splints, plaster jacket, etc.

2 Excision of the diseased part wherever possible.

3 Stitching up of a tuberculous cavity to prevent septic infection after dealing with the diseased tissues.

I shall go over the various tuberculous lesions with reference to treatment.

1 *Tubercular lymphatic glands*—If they will not yield to tuberculin, should be excised before periadenitis occurs, as it becomes very difficult surgery indeed after matting has taken place or sinuses have formed.

2 *Tubercular joints*—These should be fixed with a splint or plaster casing, and weight extension applied when possible to keep the joint surfaces apart. If the disease will not yield to this and a cold abscess forms, the joint should be opened, all tuberculous material—even the bone—excised fairly extensively, the wound filled with bismuth paste and stitched. If there is extensive disease of elbow or ankle, early amputation is probably the only thing to save life. Time should not be wasted in scraping.

3 *Caries of bone*—In case of ribs liberal excision of the carious portion of the rib should be done.

In caries of the spine, a plaster jacket should be applied early and repeated for a few months. If a cold abscess forms it should never be opened and drained and it should not be allowed to burst. The best thing to do is to make a small incision, evacuate the abscess and stitch the wound. Aspiration is not very successful as the curdy pus will not flow easily through the needle of the aspirator.

In caries of the tarsus, metatarsus, phalanges, etc., the best procedure is to excise the entire bone, as it is impossible to be sure how far the disease has extended into the bone.

4 *Pleurisy*—If the collection of fluid is serous and large, it should be partially aspirated. Even in cases of tubercular empyema aspiration is the best thing, open operation with resection of ribs is objectionable as there is danger of sepsis, and the lung does not expand. Blowing exercises should be commenced early after aspiration.

5 In *tubercular testis* excision is the best, but a careful diagnosis is necessary between a tubercular and syphilitic testis.

In conclusion, I wish to mention two methods of treatment of tuberculous lesions which may be very useful, but I have not given them sufficient trial yet to say anything definite about their utility.

1 Bier's hypycemia.

2 Heliotherapy.

FUNCTIONAL APHONIA IN A CASE OF HOMICIDAL CUT-THROAT

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(Submitted by the Associate Editor for Bombay)

I CARVALHO, age 21, fitter, a healthy but slim and short young man, was sent to me for examination and report of his larynx on 11th August, 1920. He was unable to speak at all, being unable to even whisper a syllable, having lost his voice for 24 days subsequent to an attempt to murder him by cutting his throat on 16th July at 10-30 P.M. There was no dyspnoea, no stridor nor cyanosis, he was able to breathe, eat and drink well. The wound in the throat was sutured by Col Novis, FRCS, Senior Surgeon Sir J J Hospital, on 17th July, to whom my thanks are due for allowing me permission to publish the case. The deep muscles and the cut edges of the thyroid cartilage, I am informed by Col Novis, were sewn up and the wound left open to granulate.

Examined by the indirect method, the laryngoscope showed the following picture. The epiglottis stood out prominently, obscuring a clear view of the vocal cords. There was a great deal of reddening of the epiglottis and surrounding structures, but no swelling. By repeated examinations and cocaine spray, a good view was, however, obtained. The vocal cords were slightly slackened, otherwise they moved freely both during inspiration, expiration, and attempts at phonation. No speech was possible, complete aphonia prevailing after the initial injury. As the cords moved freely, there was no paralysis of the intrinsic muscles of the larynx supplied by the inferior or the recurrent laryngeal nerves. A diagnosis was made of functional aphonia resulting from fright during the attempt made to cut his throat, and application of galvanic current to the larynx suggested. This had the desired effect and the man was able to speak soon after. On the 17th instant, when I saw him again, the vocal cords were moving both during inspiration and attempts at phonation. The epiglottis and the surrounding tissues still presented a reddened appearance due to severance of its nerve supply, the superior laryngeal, which was cut. The wound in the neck, which had healed now, lay a little below the superior border of the thyroid cartilage. The cut had therefore involved the superior laryngeal nerve alone, which is mainly a sensory nerve to the larynx, and also supplies a muscular branch to the cricothyroid muscle. This explains the loss of tone and redness of the mucous membrane of the epiglottis and the slackness of the vocal cords. The inferior laryngeal nerves were not involved at all, for the cut was high up. Total and temporary aphonia was produced, I believe, through shock of the attempt to take the patient's life, and due to inhibition of the motor centre in the inferior

frontal convolution. This was overcome by my suggestion to the patient that he would be able to speak when stimulated by the application of galvanism locally.

PHYSIOLOGICAL NOTES.

THE EXCRETION OF UREA AND SUGAR BY THE KIDNEY

In the *Journal of Physiology* (Vol LI, Nos 1 and 2), Arthur R. Cushny gives details of experiments which seem to prove that urea and sugar are not secreted in the way which Heidenhain describes for sulphindigotate of soda.

According to the writer, urea is a specific constituent of the urine and, in virtue of this, its elimination has been ascribed to a specific secretory activity of the cells lining the tubules. Heidenhain cut the spinal cord in animals, thereby causing such a fall of blood pressure that no fluid was secreted by the capsules of Bowman. Sodium sulphindigotate was injected into the blood stream beforehand and it was found to have accumulated in the interior of the epithelial cells of the tubules. The epithelial cells were therefore assumed to be the active secreting agents in the case of the above salt, and by analogy, of urea.

Cushny repeated Heidenhain's experiments, but, instead of using injections of sodium sulphindigotate, he estimated the urea in the excised kidneys of animals whose kidneys were secreting normally, and in those whose cords had previously been cut and which were secreting no urine. Not only does the secretion of urea cease when the cord is cut, but that already present in the kidney is slowly removed by the blood and lymph. If urea accumulated in the cells of the tubules, as the dye in Heidenhain's experiments, the kidney left in the body, for an hour say, should contain more urea than the one which was excised immediately on section of the cord. Not only was there no increase, but there was actually less. Therefore the analogy with Heidenhain's stain does not hold.

In a similar manner it was shown that under the influence of phloridzin the mammalian kidney is unable to accumulate sugar in its tubules and cells after the flow of urine has been arrested by section of the cord, although it is still widely held that this glucoside acts by arousing the cells of the tubules to secrete sugar actively.

The author's summary is as follows —

"1 When the spinal cord is severed no accumulation of urea occurs in the kidney, and similarly phloridzin ceases to cause the accumulation of sugar.

2 Urea and sugar thus are not excreted in the way which Heidenhain describes for the sulphindigotate of sodium, and all conclusions drawn from this analogy are erroneous. The site of secretion for urea and sugar, therefore, remains undetermined, and experiments on mammals offer no grounds for supposing that it

differs from that of the other constituents of the urine "

THE DIRECT AND INDIRECT EFFECT OF X-RAYS ON THE THYMUS GLAND AND REPRODUCTIVE ORGANS OF WHITE RATS

The results obtained by Evelyn Hewer under the above heading in the *Journal of Physiology* (Vol L, No 7) may interest workers in X-rays

"I Effect of irradiation of the thymus gland

The immediate effects of irradiation were not observed, and considering the rapidity with which other workers have found regeneration to proceed, these effects had in all probability disappeared before the examination was made. Consequently only lasting or secondary effects have been noted

No marked change in size brought about by the doses used was observed. The most striking feature was the appearance of Hassall's corpuscles. As has been said, these structures are not normally present in the rat's thymus, nor did they appear when the thymus only was irradiated. If, however, the gonads were simultaneously treated, Hassall's corpuscles appeared. These bodies disappeared after $5\frac{1}{2}$ to 6 weeks. When the whole animal was irradiated very young, Hassall's corpuscles again made their appearance after a short interval. These results support the view that the corpuscles are phases of evolution of connective tissue elements in the above cases regeneration is presumably proceeding, and this is indicated by the appearance of the corpuscles, but after $5\frac{1}{2}$ weeks, when regeneration would probably be complete, these bodies are no more seen. But it is remarkable that treatment of the thymus alone did not cause their appearance, unless the untreated gonads in some way protected the thymus so that either degeneration was not so great or regeneration was much more rapid.

Passing to the indirect effects produced on other organs by irradiation of the thymus, the gonads claim the most important place. Irradiation of the thymus alone brought about slight, but distinct, degeneration in the testes, which was more marked in the immature animal (although this may have been due to a slightly larger dose than that given to the mature rat). Delay of sexual maturity was observed in the male; the female was apparently unchanged. In no case was any alteration of the interstitial tissue observed. This is somewhat opposed to what would be expected, if the gonads and thymus exercise a mutually inhibitory action, since treatment (and presumably injury) of the thymus would then lead to hypertrophy of the gonads, and a hastening of sexual maturity.

A further remarkable result is that when the thymus and male gonads are simultaneously irradiated, distinct degeneration of the testes in both mature and immature rats occurs, but this degeneration is relatively insignificant when

compared with the degree of degeneration produced by the same dose of X-rays when the gonads only are treated. Thus the uninjured normal thymus cannot apparently exercise a protective influence on the gonads, whereas the irradiated and injured thymus can do so to a very marked extent.

Again, treatment of the whole male animal when very young with a very small dose of X-rays hastened sexual development, most markedly directly after treatment. This may not be connected in any way with the thymus, but may have been due to a general "tonic" action of the rays on development as a whole, since the animals became large and advanced for their age in a few weeks' time.

With respect to organs other than the gonads, irradiation of the thymus was not observed to exercise any indirect effects.

As regards the dose of X-rays used, when both thymus and gonads were treated, a very weak dose in young animals affected the gonads in the sense of acceleration of development, whereas in an older animal degeneration occurred with a strong dose. Degeneration also occurred, but only slightly. It is difficult to decide whether the difference is due to the indirect action of the thymus, or to the direct influence of the rays on the gonads.

II Effects of irradiation of the male gonads

The almost constant general result obtained by other workers was confirmed, namely, that irradiation of the testes determines degeneration, and that, broadly speaking, the degree of degeneration varies directly as the dose of X-rays. The previous results as to the relative sensitivity of the cells of the sperm line were also confirmed: the more immature the cell the more easily is it affected by X-rays, the spermatozoa being quite resistant while the spermatogonia succumb at once. Further, the more immature the testis is, the more sensitive is it to the action of the rays, the adult organ being harder to affect.

Once the cells begin to degenerate they disappear in one of two ways. With slight degeneration, or at the beginning of more intense degeneration, the affected cells appear to undergo resorption *in situ* since the spermatogonia are first affected; this gives rise to some vacuolation round the periphery of the tubules. But as degeneration proceeds, desquamation occurs, and spermatis, spermatocytes, and spermatogonia appear free in the lumen of the tubule. These disintegrating cells arrange themselves in stringy masses at right angles to the peripheral syncytium, giving the appearance of a "shredding" of the entire contents, as referred to by some workers. Wherever this desquamation occurred the cells involved appeared in the epididymis which was itself unaffected. With extreme degeneration the epididymis came to contain only coagulated masses of eosinophil debris.

As regards regeneration of the affected tubules, if the dose has been sufficient to destroy all spermatogonia this cannot apparently take place.

With a weak total dose recovery is complete and rapid in immature animals, and in mature animals it will also take place. With a moderate total dose regeneration can occur, if the animal is young when treated, but if as old as $8\frac{1}{2}$ weeks no recovery takes place. A strong dose (over 30X) is prohibitive of regeneration, whatever the age.

With respect to the interstitial tissue, previous work was confirmed: degeneration of the seminal tissue involves hypertrophy of the interstitial gland, and the latter disappears when recovery of the seminal tissue takes place.

It has been found by many workers that a really weak dose of the X-rays often caused a hypertrophy of the tissue that it was designed to break down,—in other words, that nuclear division was accelerated instead of arrested. Since the chromatin is undoubtedly the most sensitive point of the cell, it is quite possible that weak irritation due to X-rays might excite the chromatin along the lines of nuclear division, whereas a strong irritation might suspend its activities or even disintegrate it. The results of the above experiments in giving whole animals a very weak dose bear this out—general growth and sexual maturity were accelerated with the stronger doses, degeneration of the organs treated was invariable.

With respect to the indirect effects on other organs of irradiating the male gonads, the changes in the thymus were well marked. In all cases Hassall's corpuscles appeared after an interval of 6 weeks; these had apparently again disappeared. Now Hassall's corpuscles (as mentioned above) are to be regarded as a sign of the death and passing away of reticulum cells, and indicate the regeneration of these elements. Irradiation of the testes, therefore, determines a degeneration of the thymus which is quickly recovered from. On the theory of 'mutual inhibition,' degenerative changes of the gonads should indirectly determine hypertrophy and increased activity of the thymus, but the results here obtained oppose this theory and bear out the results when the thymus itself was irradiated, namely, that degenerative changes in the one organ are accompanied by similar changes in the other. Incidentally, it may be noted that in young treated rats hypertrophy of the thymus was common, indicating that in these the regeneration exceeds the needs of degeneration.

Of other organs, hypertrophy of the pancreas was fairly common, and in all cases examined the islets of Langerhans were much more numerous and larger than in the controls.

III Effects of irradiation of the female gonads

Previous work was again confirmed in that degeneration of the gonads was always obtained. By varying the dose given it was found that the primordial ova are the most resistant, while the mature follicles are the most sensitive. Consequently, regeneration can occur to the extent of the development of unaffected primordial ova,

even when all the older follicles have broken down.

Interstitial hypertrophy was constant, and was found to persist even when regeneration had occurred. It must be remembered that regeneration in the ovary can consist only of removal of the degenerated tissue and development of unattacked young ova, and not of increase of the germinal elements. Possibly this may be the reason for the persistence of the interstitial hypertrophy after all signs of degeneration have disappeared, and account for the difference obtaining in the male on this point.

When degeneration has been excessive, masses of colloid material appear among the connective tissue fibres, but in no case was colloid found replacing degenerated follicles, as observed by some workers.

The corpora lutea were found to be unchanged by irradiation, except that they became extraordinarily vascular. In fact, the whole ovary became very vascular, and capillary hæmorrhage was common.

A very weak dose was not used for treatment of female rats, so that there are no observations to record parallel with the hypertrophy results obtained in the male. Otherwise a dose of 17X was found to act along the same lines as a really strong dose.

With respect to indirect effects observed in other organs, changes in the thymus were again the most remarkable. Hassall's corpuscles appeared constantly, but 6 weeks after the cessation of treatment they had disappeared. Hypertrophy and anæmia of the gland were again common. These results are exactly comparable to those obtained for male rats, and the same significance must be attached to them.

Hypertrophy of the pancreas, due to increase in the islets of Langerhans, was again observed.

STRETCHING OF PARALYSED MUSCLES

In a paper entitled "Observations on denervated and on regenerating muscle" by J. N. Langley, F.R.S. (*Journal of Physiology*, Vol. LI, No. 6, p. 377 *et seq.*), the following statements on the regeneration in muscles stretched by their antagonists are recorded:

"In none of the experiments given in this paper was a splint put on to prevent extension of the paralysed muscles. The cats with paralysed extensor muscles were kept in cages for about a week, they were then put in a run opening into an out-of-doors enclosure and the animals walked freely. Thus whilst there were frequent passive movements of the paralysed muscles, they were for the greater part of the time stretched by their antagonists. The cats with paralysed flexors were kept in cages until in walking they could raise the heel slightly from the ground, they were then let out for intervals depending on the degree of recovery."

"The rapid progress of recovery in the cases given in Table V shows that the stretching of the paralysed muscles by their antagonists had little, if any, injurious effect. If there was any it must have been approximately compensated by the beneficial effect of the movements which were allowed to take place."

"It seems to me incorrect to speak of paralysed muscles stretched by their antagonists as being in a state of over-extension. They are not more extended than they sometimes are by perfectly harmless movements in life, and their tension is less than in such movements since their own tonic contraction is abolished. What is injurious is not the extension itself, but its long unbroken continuance, just as the tonic shortening of the antagonists is not injurious unless it is protracted. As the muscle atrophies, it is less and less able to withstand abnormal conditions and protracted extension becomes more and more harmful."

"In the early days after suture, movement of the joints tends to draw the nerve ends apart, whether it does so or not depends upon the firmness of the suture and its position in the length of the nerve. But the ends of the nerve soon fixed by connective tissue growth, this fixation indeed is an important function of the connective tissue, and moderate movement then has no harmful effect."

"So far as these statements can be applied to man, I conclude that in cases of primary suture, whilst the paralysed muscles should on the whole be kept relaxed, moderate passive movements might be carried out with advantage two or three times a day, as soon as the movement does not strain the skin ligatures. Probably in many cases a splint allowing slight movement would be better than a rigid one."

BLOOD SUGAR

The following important conclusions are reached by George Graham, of St Bartholomew's Hospital, as regards variations in blood sugar in health after ingestion of a carbohydrate meal (*Journal of Physiology*, Vol L, No 5, page 294)

1 A dose of 100 gms of glucose produces a sudden rise in the blood sugar in adult men which may be apparent within 10 minutes and usually reaches the maximum in 20 minutes. The sugar usually reaches its original level in 1 to 1½ hours.

2 Under conditions which cause fatigue, the blood sugar rises to a greater height and takes 3 to 4 hours to fall to its original level.

3 It is suggested that the normal rise is not due to a failure on the part of the liver to take up the sugar, but that the 'extra' sugar is on its way to the muscles and other storehouses.

4 The rise which takes place in fatigue would, on this hypothesis, be due to slight failure of the muscles and other storehouses."

THE RESPIRATORY CENTRE

The work of J W Trevan (*Proceedings of the Physiological Society*, July 15, 1916) suggests that "the respiratory 'centre,' instead of being localised to a small part of the floor of the fourth ventricle, is a chain of neurones extending along the whole of the floor of the fourth ventricle and some little distance into the *uter*, and that removal of any part of this chain produces profound alterations in the co-ordination of the respiratory movements."

THE NUTRITIVE VALUE OF MARGARINES AND BUTTER SUBSTITUTES

HALLIBURTON AND DRUMMOND (*Journal of Physiology*, Vol L.I, Nos 4 and 5, Page 235) give the results of their completed researches into this subject.

The experiments were carried out on young growing rats, which require certain accessory substances (fat soluble B) for their proper development and growth. The best natural sources of these accessory substances are milk, butter and eggs. The writers think it safe and apply their results to the dietary of the growing child.

The only substances which can adequately replace butter are margarines made of "oleo-oil" from beef fat. Owing to the high price (in Europe) of milk, butter, eggs they insist on the danger of the children and the poorer classes being fed on vegetable oil margarines unless steps are taken to provide a proper supply of milk, or the deficiency be made up by the consumption of oleo-oil margarine.

Their results are as follows —

1 "The fat-soluble accessory growth substance is present in beef-fat and "oleo-oil" and is present in margarines prepared upon such a basis. Such margarines are nutritively the equivalent of butter.

2 Coconut oil, cottonseed oil, arachis oil and hydrogenated vegetable oils contain little or none of this accessory substance, hence margarines prepared with a basis of these fats have not an equal nutritive value to that of butter.

3 Nut butters prepared from crushed nuts and vegetable fats are similarly not equal to butter.

4 Lard substitutes prepared from vegetable oils are equal to lard in their nutritive value, both alike being destitute of the fat-soluble accessory substance."

APHASIA

THE subject of Aphasia has engrossed the attention of Physiologists and Physicians for many years. The classical researches of Broca seemed to prove that the cortical area for speech was located in the left inferior frontal convolution (in right handed individuals). The motor

nerves innervating the muscles concerned in the production of speech are the fifth, seventh, ninth, tenth, eleventh and twelfth Broca's area is simply the regulatory cortical area controlling the Rolandic area connected with the motor centres of the above-mentioned nerves

According to old views there are three centres for the appreciation and utterance of spoken language, *viz* —

1 The motor centre, Broca's area controlling utterance—in the left inferior frontal convolution

2 The auditory word centre—appreciating spoken language in the posterior part of the left temporal convolution

3 The visual word centre—appreciating written language—in the left angular gyrus behind and above the auditory word centre

On this assumption aphasia has been divided into motor aphasia and sensory aphasia

Motor-Aphasia—This variety is supposed to be due to a lesion affecting the left inferior frontal convolution or the motor path connecting it with the motor area situated in the pre-central convolution

Sensory Aphasia—This may be due to two conditions, *viz*, (1) Word-deafness (inability to realize the significance of spoken words) due to an injury to Wernicke's area of the temporal lobe (2) Word-blindness, inability to appreciate written or printed language due to a lesion of the parietal part of the visuo-psychic area

THE muscles for the skilled movements of writing have their motor centres in the Rolandic area, but, it is probable that these centres are controlled by a psycho-motor area situated close to Broca's area, just as the centres for the muscles of speech are controlled by the last named

The researches of Marie and Montier have cast doubt on Broca's localisation. From an analysis of *bona-fide* cases reported in literature these observers found that in some cases motor aphasia was present in spite of the fact that Broca's area was uninjured, while in others there was no aphasia although this region was destroyed. They therefore look on Broca's area as one of the links in the chain of the speech circuit

Most authorities now-a-days do not accept the theory of separate and distinct visual and auditory word centres, but rather postulate a large diffuse area in the left temporo-parietal region in which recognition of spoken and written language takes place. Rendle Short states that there may be a special departure platform in Broca's area. In this most authorities agree

The condition known as anarthria—loss of external with retention of internal speech (the patient can say the words over in his own mind but is unable to utter spoken words)—sheds some light on aphasia. Anarthria may be due either to a lesion of the left temporo-parietal lobe, in which case there is always some diffi-

culty in appreciating spoken or written language, or to a lesion of Marie's quadrilateral—that portion of the brain substance lying between the Island of Reil and the wall of the lateral ventricle, containing the external capsule, claustrum and lentiform nucleus. The lesions of this portion of the brain would be likely to injure projection fibres from the cortex lying in the internal capsule. Whether there are special projection fibres in the external capsule connected with Broca's area is undetermined

According to Rendle Short, the practical outcome of recent researches in this subject, is not to trust aphasia as conclusive evidence of a localised lesion in the left inferior frontal convolution, but, rather to look to the temporal lobe especially if there is defective *appreciation* of spoken or written language

LITERARY NOTES.

WE have received a reprint of a paper by Dr J Tertius Clarke, M.R.C.S., L.R.C.P. (Perak), read at a meeting of the Society of Tropical Medicine and Hygiene on January 16th, 1920, entitled 'The Etiology of Rheumatic Fever from a Tropical point of view'. The writer essays to prove that the carrier of the causal organism of rheumatic fever is a flea, either the human flea (*Pulex irritans*) or the rat flea (*Ceratophyllus fasciatus*) which also bites man.

The facts from which he deduces this proposition are as follows —

(a) Rheumatic fever is a disease of towns, and fleas are more prevalent in towns

(b) The wave crests of scarlet fever and of rheumatic fever agree as to the time of the year in which they occur

(c) In England a correspondence between the wave crests of scarlet fever and the highest prevalence of fleas has been shown

(d) Both scarlet fever and rheumatic fever are diseases of dry years

(e) Fleas are more prevalent in dry years, and the highest incidence of both scarlet fever and rheumatic fever is in the period immediately following the dry months, *i.e.*, just after the highest flea incidence

(f) Neither rheumatic fever nor scarlet fever occurs in the tropics

(g) The number of fleas in the tropics is small compared with the numbers in Europe. The only flea which is at all common in the Federated Malay States is the cat flea (*Ctenocephalus felis*). The human flea (*P. irritans*) and the European rat flea (*C. fasciatus*) have not been found in the Federated Malay States (Fletcher). *C. fasciatus* has not been found in India south of the United Provinces except in the Nilgiri Hills, and is never common in the United Provinces. In the United Provinces it is only found in the cold weather

(h) The highest number of fleas occurs in the period immediately preceding the greatest

rise in the number of cases of rheumatic fever and scarlet fever

The reasons given for specially selecting *Ceratomyxus fasciatus* as the probable carrier are that it is the commonest man-biting flea whose host is other than man, which is not found in the tropics

While it cannot be said that the writer has produced any positive or experimental evidence, we are of opinion that a *prima facie* case has been made out and one may hope that we shall shortly hear of actual biting experiments with *C. fasciatus* to determine whether the disease can thus be communicated from man to man. At any rate, the subject offers a promising field for research

THE *Clinical Journal*, published by H K Lewis & Co, Ltd, has resumed weekly publication. Two specimen copies which we have received contain important articles by Dr W Langdon Brown, Mr R P Rolands, Drs T Berwyn Davies, F Parkes Weber and others

The journal was founded in 1892 with the clinical lectures given by the leading physicians and surgeons of the day, and thus giving the general practitioner access to the latest clinical teaching. At first a weekly publication, circumstances connected with the war made weekly issues impossible. We are therefore pleased to hear that they have been resumed from 7th July, 1920. On account of its low price, and the excellence of the material contained therein, this journal should find ready subscribers among general practitioners all over the world

A Mirror of Hospital Practice

REMOVAL OF FILARIA FROM UNDER THE CONJUNCTIVA

By E CHARLES,

Ophthalmic Hospital, Gujranwala

BAGGA, son of Hira, aged 45, resident of Sialkot district, near Jammu State territory, had, some eight months ago, sudden severe pain in his right eye, and soon after he felt a little swelling on the inner and lower side of his eyeball. The pain—of a neuralgic type—subsided at night, when it was cold, but increased in the day time

Present condition—A fairly large swelling on the inner and lower side of the right eye beneath the ocular conjunctiva, redness, watering, dilated pupil, patient in great pain, vision not affected

Operation—Under cocaine, two days after admission, a small incision with a Graefe's knife

was made into the swelling and a loop of a living worm began to come out of the opening; just when the head was being pulled out, the patient complained of severe pain. The pulling was therefore stopped and the worm began to crawl in again. When a small portion of the worm had gone back, a sudden pull brought it out complete. Recovery was uneventful and the patient discharged cured about a week later

NOTE ON MR CHARLES' SPECIMEN

By R S SEWELL,

MAJOR, I M S,

Offg Superintendent, Zoological Survey of India

THE specimen sent to me by Mr Charles is unfortunately so contracted and shrunken owing to its having been preserved in spirit that it is impossible to arrive at any definite conclusion with regard to it. It appears to be a female *Filaria*. The worm measures 33 cm in length and 2 mm in width throughout the greater part of its length, but in life it must have been somewhat larger than this. The body of the worm is flattened from side to side, and the colour is pale yellowish-white. The cuticle is transversely striated and throughout the whole length of the body longitudinal striæ can be seen in the body wall. The anterior end is club-shaped and devoid of papillæ. The mouth is situated terminally. At the posterior end there is a pair of rounded folds or prominences situated close together ventrally, just in front of the extreme tip which is somewhat truncated. In all probability the worm is an example of *Filaria* (?) *conjunctivæ*, Addario. There appears to be considerable confusion in the literature regarding this worm and in consequence the synonymy must be regarded as doubtful. Similar, if not identical, worms have been from time to time recorded from similar situations. Dubini was the first to record it from the eye of a man in Italy and Addario obtained his specimen from a cyst in the ocular conjunctiva. Another example was found by Alessandrini in 1906. Braun gives *Filaria inermis*, Grassi, *F. apapillocephala*, Condorelli-Francaviglia, and *F. peritonei hominis*, Babes, as synonyms. In the case of this latter example the worm was found in the gastro-splenic omentum. Possibly the worm described under the name *Agamofilaria palpebralis*, Pace, in 1867, which was taken from a cyst in the eyelid of a patient, is a further example. Very little is known about this latter group, the term *Agamofilaria*, under which heading several different species are described, is not a generic name but "a group name for immature *Filaria*, the development of which does not admit of generic determination" (Fantham and Theobald).

The normal hosts of *Filaria conjunctivæ* are stated to be the horse and the ass.

A TWO-OUNCE STONE IN THE URETHRA

By A N SARKAR

Assistant Surgeon, Sadr Dispensary, Hazaribagh

BUDHU BHUYAN, Hindu, aged 60 years, came to hospital in the afternoon of 10th June, 1920, complaining of great difficulty in passing urine for the last 12 days

On examination the scrotum was found to be about 8" in diameter and in a gangrenous condition. Temperature, 101° F. Passing urine in drops per meatus.

There was a history of gonorrhoea years ago and dysuria for the last 10 years.

Rupture of urethra with extravasation of urine was diagnosed.

The gangrenous mass was dissected off as far as possible, when urine was passed freely by the perineal opening. Hexamin gr. x with sodium sulph. 5i T. D. was prescribed.

With daily hot baths and compresses the sloughs cleared up and the ulcer became covered with healthy granulations (15th June, 1920). The flow of urine per meatus increased while less and less was passed by the perineal opening. On 1st July, 1920, the man complained that most of the urine was again being passed by the perineal opening. Developing stricture was suspected and the passage of a sound advised. The sound, however, could not be got beyond the penile portion of the urethra. On palpating the perineum something hard was felt beneath the ulcer. The sound when passed through the perineal opening elicited grating. Next morning a rounded stone about 2" in diameter and weighing 2 ounces was extracted through a longitudinal mesial incision. It was marked with a few fissures on the surface and along these the stone divided, when dry two days later, into 5 pieces, one of the pieces contained a round mass about 1" in diameter.

Further enquiry at this stage elicited the history of a fall astride a bamboo many years ago.

The man is still under treatment for the perineal wound. His general condition is good.

LONDON SCHOOL OF TROPICAL MEDICINE EXAMINATION RESULT, 63RD SESSION, MAY-JULY, 1920

Passed with Distinction—

Lane, T J D, M B, B Ch—Gained "Duncan" Medal

Jamison, R, M B, B Ch, R U I, P M O, Swaziland

O'Driscoll, Miss E J, M B, Ch B, R U I

Reynolds, F E, M B, Ch B

Passed—

Mackenzie, M D, M B, B S

MacKay, J M, M B, Ch B, West African Medical Service

Hawes, R B, M R C S, L R C P

Glavina, J, M D, (Malta)

Forrest, J, M B, Ch B, Major, I M S

Critien, V E, M D (Malta)

Eldaab, S A, M R C S

Holmes, J V, M B, B Ch, B A O, D P H

Wilson, G C R, M R C S, L R C P, Tanganyika Territory

Parry, J H, M R C S, L R C P, Tanganyika Territory

GASTRIC ULCER

SIR BRILLIY MOYNIHAN writing in the *British Medical Journal* (Dec 13, 1919), states that contrary to the general opinion of the profession gastric ulcer is a disease of comparative rarity, its diagnosis from the clinical evidence alone is difficult, its mimicry by other conditions extremely frequent.

Of the three classical symptoms of gastric ulcer, *viz*, *pain*, *vomiting*, *haematemesis*, the first named alone is of much diagnostic importance.

The pain in gastric ulcer is characterised by its regularity. It comes after *all meals* and one to one and a half hours after ingestion. In duodenal ulcer the pain usually appears two hours or more after food. The pain in gastric ulcer usually disappears after an hour or so. Food usually relieves the patient and relief is also obtained from alkalis, sodium carbonate mint drops, vomiting and lavage. The usual sequence is food, comfort, pain, food, comfort, pain.

The pain is usually described as "boring," "burning," "aching" or "gnawing." There may be severe pain in the back. That relative periods of pain and comfort may be modified by cicatrization and resultant deformity or obstruction, by perforation and involvement of neighbouring structures, or by malignant degeneration.

Vomiting is an inconspicuous feature apart from obstruction due to cicatrization. On this point the author writes—

'When in the record of any patient suffering from 'dyspepsia' there is a story of frequent vomiting, of the inability of the stomach to tolerate the presence of any food, even fluid nourishment sparsely taken being at once rejected, the thought that gastric ulcer is the cause should be driven from one's mind.'

Haematemesis and melæna occurred in less than 25 per cent of the author's cases. It is more commonly due to such conditions as splenic anaemia, cirrhosis of the liver, appendicitis, and other infective conditions within the abdomen.

Among other methods of investigation the writer places most reliance on X-ray examination after administration of a barium or bismuth meal. He writes as follows—

"In this work I have relied upon my colleague, Mr Scargill, and I am greatly indebted to him for his most careful and accurate work and for the skill which he shows in the technical side of it. His methods, which follow

closely upon those of R D Carman, of the Mayo Clinic, show that the possibility of making an accurate diagnosis of gastric ulcer is greatly increased by the X-ray examination, that, indeed, the radiographic examination alone is more accurate than all other methods combined, and that a diagnosis which is proved by subsequent operations to be correct in indicating the presence of the ulcer or in demonstrating its size and position can be made in about 90 per cent of cases

"The following is his method of examination. After a few hours of fasting, when the stomach is presumed to be empty, a bismuth or barium meal of thin consistency is given, and six hours later the first examination is made. By this time a normal stomach is able to empty itself of the small amount of opaque food administered. If a residue is seen, there is a delay indicating defective action. A second similar meal is now given and the stomach examined forthwith. The radiographic signs of gastric ulcer are —

"1 *Direct*—The ulcer cavity itself is demonstrated. If an ulcer has penetrated into the walls of the stomach, or eroded the liver or the pancreas, or perforated sub-acutely and become adherent to the abdominal wall, the crater of the ulcer can be seen filled with the opaque substance of a meal. If the ulcer is near the lesser curvature, it is visible in either an antero-posterior or semilateral view. If the ulcer is on the posterior surface the best view is obtained when the stomach is emptying. An ulcer on the anterior or posterior surface of the stomach close to the pylorus is more difficult to demonstrate

"2 *Indirect*—In the majority of cases of gastric ulcer a very remarkable and sustained contraction of the circular muscular fibres of the stomach occurs in or near the segment on which the ulcer lies. An indentation of the greater curvature, of varying degree and extent, but often so considerable as to appear almost to bisect the stomach, is most clearly seen. Its appearance, whether on the screen or on a photographic plate, is remarkable. The spasm, in the majority of cases, remains stationary during the examination, it is unaltered by palpation, massage, or by the administration of large quantities of belladonna. It relaxes under a general anæsthetic, and is not seen on the operation table, the stomach wall being then quite soft and flaccid. A similar 'incisura' is present as the result of extrinsic causes—causes lying, perhaps, remote from the stomach. The commonest excitants are duodenal ulcer, infection of the gall bladder, with or without stones, and chronic appendicitis. The spasm due to these causes is variable in position and duration, is modified by massage or pressure, and relaxes almost always after the administration of atropin given in an amount which produces a physiological response. It is also inconstant, pre-

sent on one occasion, absent on another, and changes capriciously

"The presence of persistent spasm is strong presumptive evidence of the existence of an ulcer, the presence of an 'incisura' on the greater curvature, with a 'bud-like' opaque projection on the lesser curvature, is an unequivocal evidence, in every such case an ulcer is present

"The radiographic method is the one certain method of diagnosis, and is now an indispensable addition to the older and far less accurate procedures"

Chemical examination of the stomach contents—The author has given up this method of investigation as he finds hyperchlorhydria present in so many other diseases. In a large percentage of proved cases there was no hyperchlorhydria, and in some there was even hypochlorhydria

Physical examination affords little help. Tenderness may be found especially high up on the left side

Discussing the differential diagnosis the writer states that gastric ulcer does not cause symptoms merely because of the structural defect which is present, but because of the co-existence of three conditions, viz —

1 Evidences of infection around the ulcer, such as inflammation, induration, local peritonitis, etc

2 Spasm of the musculature of the stomach

3 An increase in the acidity of the gastric juice

These three conditions may be present in varying degree in other conditions which are able to arouse a gastric reflex

The writer deals with the treatment of this disease under the headings —

(a) Medical treatment

(b) Surgical treatment

(a) *Medical treatment*—The most rational of all methods is that introduced by Sippy. It depends on the reduction of the acids in the stomach, an end which is attained by dilution of food, alkalization of the gastric contents every hour, and the administration of fats

(b) *Surgical treatment*—Gastro-enterostomy is the operation which is usually performed. It may be supposed to have two effects, a "mechanical" one whereby the stomach is more readily drained and a "physiological" one depending on the neutralisation of the gastric contents by the escape into the stomach of the pancreatic juice and bile. The writer is averse to gastro-enterostomy except in cases of existing or threatened obstruction. Gastro-enterostomy combined with cauterization of the ulcer (Balfour's operation) is recommended as better than excision of the ulcer

Finally Sir Berkeley Moynihan expresses a predilection for partial gastrectomy where possible. It does away with any chance of recurrence and banishes the danger of carcinomatous change

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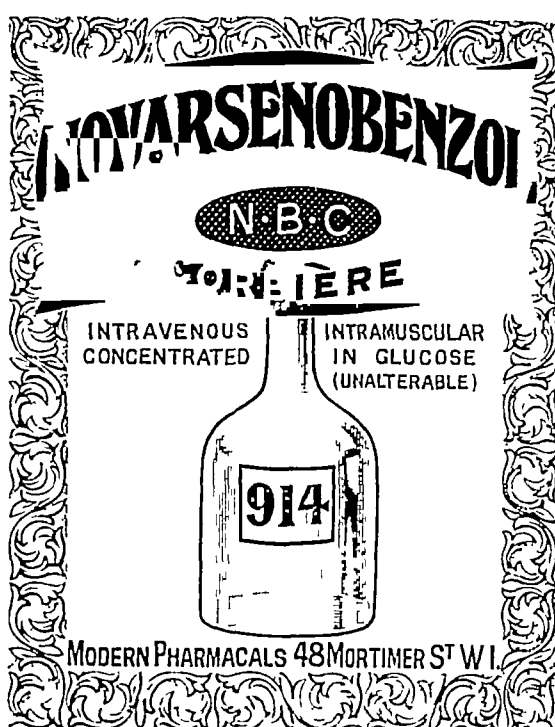
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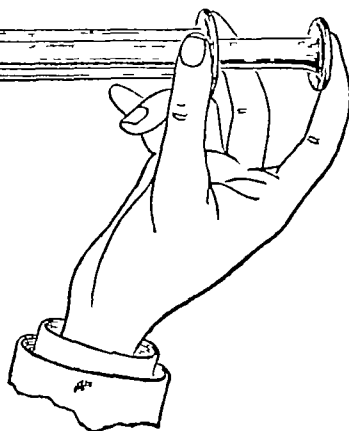
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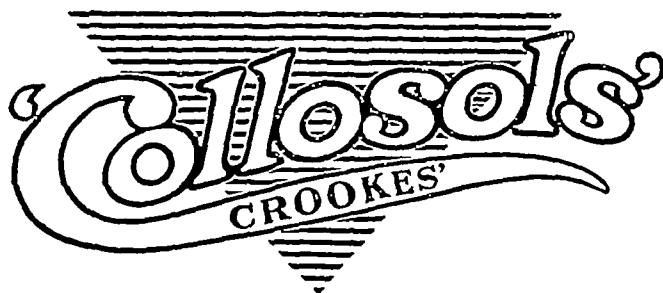
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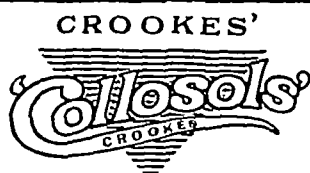
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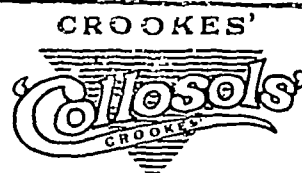
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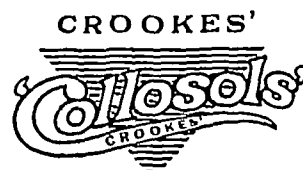
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 diseases of the Eye, Ear, Nose
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Indian Medical Gazette.

OCTOBER

INFLUENZA

DR SAJOUS' paper on the Pathogenesis, Prophylaxis and Treatment of Influenza, the full text of which is published elsewhere in this issue, will be read with interest by all who witnessed the ravages of the 1918 and following pandemics

It will be seen that Dr Sajous holds that Pfeiffer's bacillus, although it does not act in accordance with Kock's postulates for pathogenic micro-organisms, is still the true pathogenic organism of influenza. It is an organism which requires very special conditions for its growth, and the pulmonary alveolus is the only part of the respiratory tract which presents all the necessary conditions—haemoglobin, oxygen and temperature

The battle for supremacy between a filter-passing virus and the bacillus influenza is not yet ended. Dr Sajous refers to the former as promising only a certainty of time-consuming labour. The reader will remember that Gibson, Bowman and Connor(1) described a minute coccoid organism which can be grown

- (a) From the kidney of infected animals
- (b) From the filtrates of infected lung tissue
- (c) From the filtered sputum of influenza cases

It was concluded that this is the underlying causative organism, and that all the other micro-organisms associated with influenza such as Pfeiffer's bacillus, streptococcus, pneumococcus and micrococcus catarrhalis are secondary in nature. The results of Gibson and his collaborators have been confirmed by other observers. Quite recently Olitsky and Gates(2) claim to have discovered a filterable virus in the nasopharyngeal secretions which is pathogenic for rabbits

A review of the German work on influenza during 1918 and 1919(3) shows that Pfeiffer's bacillus was by no means constantly found in influenza cases. In fact, not one of the authors whose work is reviewed claims that it is the causative organism of influenza. Their results are of the same general nature as the results obtained during the same period in other European countries and America (4), *viz*, that Pfeiffer's bacillus cannot be regarded as the primary causative organism of influenza

On the other hand, it is interesting to note that Crofton(5) states a strong case for the influenza bacillus as follows —

1 The microbe appeared with the appearance of the epidemic

2 It was isolated when the conditions were suitable from a large number of cases

3 A pure influenza bacillus antigen produced a marked degree of prophylaxis

4 It rapidly cuts short the disease when the infection is uncomplicated

5 A pure influenza antigen can produce all the symptoms of the disease

6 The serum of influenza patients agglutinates the influenza bacillus

Malone (6), in his bacteriological study of influenza in Calcutta in 1919, found the following organisms most constantly present —Pneumococcus (96 per cent), Streptococcus (86 per cent), Pfeiffer bacillus (78 per cent)

In the present paper we have Dr Sajous supporting the classical view that Pfeiffer's bacillus is the causative organism. In this connection it may be mentioned that Dr W J Penfold(7) suggests that B influenza (Pfeiffer) is the specific organism, but has a filter-passing stage. A conception such as this would seem to bring the diverging views into line and has much to recommend it

PROPHYLAXIS

Whatever views we hold as to the actual cause of influenza, prevention would seem to be more important than cure, both from an individual and public point of view. In this connection Sajous cites the immunity enjoyed by workers in toxic gas manufacturing plants [with the exception of workers in Phosgene gas (COCl_2)] Shuffelbotham(8) showed that workers in sulphuretted hydrogen, chloro-picrin, chlorine and mustard gas, enjoyed a high degree of immunity compared to the general community. On these grounds, and because iodine provokes a local defensive activity of the lymphoid and epithelial cells, Sajous recommends inhalations of iodine fumes both as a prophylactic and curative measure. Dr Sajous, in fact, recommends that all public places of amusement, schools, shops, hotels, churches, offices, factories, barracks, hospitals, etc, should be converted into "sterilising and immunising inhalatoria". Further, he suggests that apparatus for iodizing the air should be kept in every home. This last must be looked on as a counsel of perfection, but provided Dr Sajous' convictions are confirmed experimentally

in this country, there is no reason why public places such as churches, theatres, and the like should not be iodised (and at a small cost) when influenza is prevalent

Sir Thomas Horder(9) dealing with preventive treatment in influenza divides the subject under four headings (1) The prevention of epidemics, (2) Prophylaxis as it concerns the community, (3) Prophylaxis as it concerns the individual, (4) The control of the epidemic when it arrives. Under the first two headings, he has little to say. Prophylaxis in regard to the community seems to resolve itself into the maintenance of a high standard of general health by providing air, light, exercise, rest and good food. Prophylaxis in regard to the individual is in an equally unsatisfactory state. Keeping fit is no protection, and specific immunization not of any proved value. Something, however, can be done to control the epidemic when it has arrived and Sir Thomas Horder recommends

- 1 Quarantine at the ports
- 2 Early diagnosis, notification, and isolation of the infected
- 3 A proper system of hospitalization

Quarantine measures were given an extensive trial in Australia in 1918, and, while apparently successful for the first three months, did not prevent the outbreak of an epidemic in January, 1919, which, though milder in character than the general pandemic, lasted longer and accounted for a total mortality almost equal to unprotected countries of about the same population—Cf New Zealand. This measure cannot, therefore, be pronounced an unqualified success.

Early diagnosis, notification and isolation of the infected, are measures which have their advantages and Sir Thomas thinks much might be done in this direction.

A proper system of hospitalization organised by the Ministry of Health is considered by Sir Thomas Horder likely to prove the greatest of all our checks to the spread of an epidemic. For details the reader is referred to the original paper. He is a firm believer in the value of fresh air, and places no confidence in drugs internally, nasal douches and the like.

A communication from so high an authority as Dr Sajous cannot be lightly laid aside, and we would suggest that the new principles in prevention and treatment of influenza put forward in his paper should receive the serious attention of the Government of India. Their applicability to India and their utility should be

thoroughly tested. This is work which might profitably be undertaken by the Indian Research Fund Association. Now is the time to prepare our defences against the next epidemic and not when it has actually arrived. The last epidemic cost India 5,000,000 lives—an economic loss which justifies expenditure of money and energy in an effort to prevent its repetition.

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- (6) *Indian Journal of Medical Research*, Vol 7, No 3
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Current Topics.

The Treatment of Influenza.

DR C B RICHARDSON, M.D., L.R.C.P., etc., advocates the administration of phenacetin grs 3-5 every four hours for a day or two for adults, followed by a carbohc mixture, every four hours, if cough and lung symptoms predominate, or three times a day for mild and suspicious cases. The composition of the mixture, which is continued as long as cough lasts, is as follows—

Glycerine Acid Carbohc	m lxxx
Glycerine	dr iii
Syrup Papaveris	dr iii
Aqua	add oz viii

Cap oz 1, Iv horis, vel in quotion

The author has never observed any carboluria or other unpleasant symptoms

Hysterical Deaf-mutism of Eighteen Years' Duration.

Proceedings of the Royal Society of Medicine (Section of Otology) December, 1919
Vol XIII, No 2, pp 8-11—A F HURST, M.D., AND W M MOLLISON, M.Ch

THE patient was a young man, aged 18. His mother stated that he heard perfectly well when he was a baby, but she could not give a definite account as to when he first became deaf. It appeared that the deafness either began after a slight illness or after a fall on his head somewhere between nine months and three years. At a later date a number of aurists were

consulted, and all of them stated that this observation must have been incorrect, and that the patient must have been deaf from birth. With great difficulty he was taught to speak, but he speaks like a deaf-mute, extremely indistinctly. He does not remember even having heard anything at all, except on rare occasions during the last few years, when he thinks he has sometimes heard a loud noise, though possibly he really only felt the vibrations of the sound.

Dr Hurst saw him at Seale Hayne Hospital at the beginning of May 1919. He appeared to be completely deaf, but the vestibular reactions were perfectly normal. It was therefore explained to him at the first meeting, by the aid of lip reading, at which he is an expert, that he could not hear because he had never tried to listen, and that if he once made the effort to listen he would begin to hear. On this first occasion he was taught to listen sufficiently to hear his name pronounced, this was the first word he ever remembered having heard. The same day he heard his bicycle bell and a motor horn for the first time. During the course of the next three weeks he learned to hear a number of words, but each word had to be taught separately, as although he could hear the sound it conveyed nothing to him until he realized what the sound meant by lip reading. When once learned, he could understand it on a future occasion but found it extremely difficult to continue to listen for more than a few moments, so progress was slow. At his best he could hear a familiar word from the other side of the room without the voice being raised, but frequently it was necessary to shout a word into his ear. At the same time he improved sufficiently to hear all ordinary sounds. He could hear a band, and he could hear himself playing on the piano, but he had no idea of pitch, and could not distinguish one note from another. The conclusion was reached that, whatever its original cause, the deafness must have been temporary, but that having come on at a period when he was just learning to listen, it interrupted his development in this respect, and he never learned to listen again, so that the deafness must really be regarded as hysterical, though of organic origin.

A recent examination by Mr. Mollison showed that there was no evidence of disease of either middle or internal ear, in spite of this, before treatment, the deafness to both ear and bone conduction was absolutely complete, and the auditory motor reflex (dilatation of the pupil and blinking in response to loud sounds) was completely absent. The reflex is now normal.

In closing the discussion that followed, Dr Hurst stated that he had chosen the expression "hysterical deaf-mutism" after the most careful consideration. The word "functional" would no doubt also be correct, but it was not sufficiently definite, as functional merely meant not organic, and there were many functional conditions besides hysteria. Although etymologically the word hysteria was an unfortunate one,

it was impossible in this stage of the history of medicine to discard it, as no good substitute had been suggested and it had become so universally accepted throughout the world. During the war, Dr Hurst had had an exceptional experience of hysteria and was led to modify the generally accepted definition in the following way: "Hysteria is a condition in which symptoms are present which have been produced by suggestion and are curable by psychotherapy." It would be seen that nothing was said about any underlying mental condition, as there was nobody who may not develop hysterical symptoms if the suggestion was sufficiently powerful. Though it was true that the so-called hysterical type of person was more liable to develop such symptoms than other people, this abnormal liability did not constitute hysteria any more than a tuberculous family history constituted tuberculosis. In this particular case the suggestion of deafness occurred during infancy, and was in the nature of an organic but temporary deafness caused apparently by injury. There could be no more powerful suggestion of a permanent incapacity than a temporary incapacity of the same nature caused by organic injury or disease. The infant was learning to listen and to hear at this period, but being temporarily deafened he ceased to listen, and he was never taught to do so until 18 years later. Then the psychotherapy, in the form of explanation and re-education, was sufficient to teach him once more to hear, although of course a considerable amount of further education would be required before his hearing became normal.

The Speech of Epileptics

Proceedings of the Royal Society of Medicine (Section of Psychiatry) February, 1920
Vol XIII, No 4, pp 18-22—By E. W. SCRIPURE M.D. With two illustrations and four charts.

In a study of inscriptions of speech in various nerve diseases records of 13 cases of epilepsy were made and analysed. The results were presented before the New York Academy of Medicine. At a later date the work was continued at Claybury at the National Hospital in Queen Square, at the West End Hospital for nervous diseases, and at the Maida Vale Hospital.

The inscriptions are made by speaking into a wide tube ending in a flexible membrane. The vibrations and puffs of air pass down the tube and move the membrane. These movements are enlarged by a light lever and recorded on a surface of smoked paper on a revolving drum, the record sheet being afterwards removed and varnished.

To the eye the inscriptions by epileptics do not differ from normal inscriptions, but when measurements are made by a micrometer microscope a peculiarity is at once detected.

The vowels and vibrating consonants appear in the inscriptions as series of fine waves. The length of each wave is measured and the results

are plotted on cross-section paper. A long wave is the registration of a low tone of the voice, and a short wave of a high tone. A line drawn through the series of dots thus plotted, gives the rise and fall of the voice, or the melody of the words spoken, and is known as the "melody plot."

The melody plots for normal speech show that the voice is continually rising and falling, it is never steady on the same pitch for an instant. This is quite independent of the general melody of the phrase, whether the person speaks with rising or falling inflexion, or with great or little modulation of the general melody, he always shows this finer fluctuation or flexibility of melody.

The melody plots for epileptic speech show a diminution or an absence of the finer fluctuations. The melody lacks flexibility.

The melody plots for various nervous and mental diseases, such as the spastic conditions, general paralysis, hysteria, melancholia, mania, etc., show either no changes from the normal melody, or else changes unlike those of epilepsy. Hysteria, for example, is characterized by exactly the opposite condition of over-flexibility. For purposes of differential diagnosis this inflexibility of epileptic speech is perhaps more to be relied on than an actual fit. An hysterical fit often so closely resembles an epileptic fit that the most careful observer cannot declare it to be non-epileptic until he has a most intimate knowledge of the person's life.

Inflexibility, apart from the rigidity of monotonous speech, does not occur in any organic condition yet studied. On the other hand variation in melody is one of the ways in which a normal person expresses a mental attitude. Inscriptions of the word "oh" spoken with various attitudes of admiration, doubt, astonishment, etc., differ only in the melody plots. The inflexibility of the epileptic melody is characteristic.

To the ear epileptic speech sounds expressionless or wooden, and with little difficulty the ear can be trained to detect it. In cases of malingerers this sign has a special value. In the first place the patient knows nothing about it. In the next place the peculiarity cannot be imitated voluntarily, for being, as it seems to be, an expression of the epileptic temperament, it cannot be produced artificially.

Treatment of Causalgia.

The Journal of the American Medical Association Vol 74, No 1 January 3, 1920—DEAN LEWIS, M.D., Chicago, and WESLEY GATEWOOD, M.D., Iowa City.

IN this the authors report three cases of this most distressing complication or sequela of peripheral nerve lesions. In two of these previous neurolysis was performed without relief. In all these intraneural injection of 60 per cent alcohol gave almost immediate relief from pain and in two muscular power re-

turned within four to six months with entire satisfaction, while in the third return of power was incomplete. The affected nerves are exposed under general anaesthesia, and from 1 to 2 cc of 60 per cent alcohol injected above the site of injury.

The authors believe 60 per cent alcohol interrupts the conduction of sensory impulses but does not interfere with the transmission of motor impulses, and motor palsies, when they do develop, are transitory and are rapidly recovered from. They would recommend intraneural injection being done whenever neurolysis is undertaken for causalgia.

Ether-oil Colonic Anaesthesia.

The Journal of the American Medical Association July, 1920—WALTER LATHROP, M.D., Hazleton, P.A.

THE author briefly touches on the history of colonic anaesthesia and the evolution of the present method of ether-oil colonic anaesthesia. The number of cases, chiefly gonorrhea, where this method of anaesthesia was taken advantage of was 1,002. The results have been satisfactory and encouraging.

Two facts help to explain the even anaesthesia obtainable with this method.

1 While ether boils at 34.6° C, it does not escape violently from an oil-ether mixture, as from an aqueous mixture when heated higher, nearly to 37° C, or body temperature.

2 The rate of separation of ether from oil quickly acquires a definite and fairly fixed speed.

Modus operandi—"Within five minutes after the injection of the mixture into the rectum, it is heated to body temperature, some ether leaves the oil in the form of gas, which is absorbed by the blood in the capillaries about the colon. The ether is carried through the liver by the greater circulation to the heart, and from there it is pumped into the lungs, where some of it is excreted by the air passages, while the remainder is reabsorbed, and carried on to the brain and central nervous system. The odor of ether and paraldehyde can be detected on the breath in from three to five minutes after the administration of the preliminary dose."

Condition of the patient during anaesthesia—"The respiration is normal, as a rule, and very seldom noisy or stertorous, if the anaesthetist is watching the patient. The eye reflex is usually retained, even though good muscular relaxation is present.

The pulse is maintained at an even plane, if rapid, as in hyperthyroidism, it usually remains so, though we frequently get a slowing, which is no doubt psychic. In ordinary cases the pulse remains full and strong. The blood pressure varies. In cases of great nervous tension, such as exophthalmia, observation has shown that the pressure falls after the patient is asleep, and usually rises immediately on his regaining consciousness. The diastolic pressure is usually low. Pressure in ordinary cases does not vary

much, though the amount of surgical interference naturally has a decided effect. This applies to hæmorrhage, and undue manipulation of viscera." One occasionally notices analgesia, when one can converse with the patient at different times during operation.

Advantages of the method—"The method insures prevention of shock, narcosis is smooth and of uniform depth, pulse and respiration remain near normal. A complete relaxation of the muscular system is secured. The stage of excitement is eliminated. The patient inhales a warm, moist vapor, and the direct irritation of a concentrated vapor is overcome. There is no eructation of gas, before or after, in 95 per cent of cases. Hypersecretion of mucus and saliva is absent. The patient's stomach, lungs and kidneys are spared. The absence of the ether cone in surgery of the head and neck lessens the technical difficulties of the operation by giving continuous access to the field of operation."

"Postoperative nausea and gas pains are reduced to a minimum."

Technique—"The author's technique is so clearly and briefly stated that it may with advantage be quoted in extenso.

"It is most important that the use of the mixture be in the hands of one who can begin its administration and have it under his care throughout and in all cases. It should never be delegated to a different physician or nurse each time it is used. The same care should be taken as in any other type of anesthesia. Experience is the great factor, and in our earlier work we used much more anesthetic than at present. After trying out various combinations and proportions we settled down to the routine method to be described. The patient should be under observation for twenty-four hours or more. This does not apply to exophthalmic or hyperthyroid conditions, in which preliminary observation and treatment are imperative. The evening before operation an enema of soapsuds (2 pints) is given. A second enema of 1 or 2 pints of clear, tepid water is given early the next morning. To illustrate: Supposing the operation is set for 11 A.M., then at 9-30, 2 drams of olive oil (warm), 3 drams of paraldehyd and 4 drams of ether, are given. The patient should be kept as quiet as possible. At 9-50 $\frac{1}{4}$ grain of morphin and 1/150 grain of atropin are given hypodermically. At 10-20 3 or 4 ounces of ether and 2 ounces of olive oil (warm) are given. The oil and the ether are put in a bottle and shaken thoroughly. The patient should be on the left side with both knees flexed, the right acutely. A rectal or colon tube with a funnel should be inserted not more than 6 inches, care being taken to have the mixture in the tube and all air expelled, before inserting. The mouth and nose should be covered with several thicknesses of gauze. The injection should be given slowly, about one ounce a minute, the funnel being held about 3 inches above the level of the patient. The tube should be clamped and allowed to remain in the rectum so that the mixture may be withdrawn during operation if there should be any indication for doing so. If there is any excitement, 15 or 20 drops of chloroform usually quiets the patient. If the patient cannot retain the oil-ether mixture, one should not try to repeat, but abandon it. The patient should be ready for operation in from twenty to thirty minutes from the time the last injection is given. The reversed Trendelenburg position seems to aid in the maintaining of an even plane of anesthesia. The jaw should be supported so that respiration will be unobstructed.

In alcoholic subjects, 1/100 grain of scopolamin

(hyoscin) is added to the preliminary hypodermic injection of morphin. When the operation is completed, the bowel should be well irrigated with tepid water until it returns clear. The colon may be gently massaged from right to left to aid this. One pint of water is then put in the bowel and left, or olive oil may be given in quantity of 4 ounces, to prevent any possible irritation that may be feared, though in more than a thousand cases we have had only two instances of irritation, both being an annoying looseness, which speedily yielded to treatment.

Hyperthyroidism or exophthalmia offers a most striking condition in which the value of this method is shown. These patients, as is well known, are usually high strung, nervous and apprehensive, while the danger itself is by no means small. We have repeatedly operated, with little or no knowledge on the part of the patient, stealing the gland has indeed been easy. The procedure with these patients is as follows: Supposing operation is decided on for Saturday, then a week previous, we give each day an injection of 2 ounces of tap water, with a dram of ether in it. Thus, the patient is told, is for its tonic effect. The morning of operation she is given the regular dose of ether-oil and paraldehyd followed by hypodermic, and the full mixture, all-given while she is in bed. She usually goes to sleep very quietly, though at times requiring a few drops of chloroform, is taken to the operation room the gland removed, or ligation performed, and when she awakens, she is in her bed, with little knowledge of what has taken place, aside from knowing something has been done to her throat, but the fear is greatly lessened or gone."

Milroy Lectures on the Higher Fungi in relation to Human Pathology.

The Journal of Tropical Medicine and Hygiene
—May 15, 1920. A CASTELLANI, C.M.G.,
M.D., M.R.C.P. (London)

IN his second Milroy lecture on the Higher Fungi in relation to Human Pathology, Castellani shows that the higher fungi may attack any organ and system of the human body, the integumentary system being the most frequently and the nervous system the most rarely affected, and touches on the following so-called internal mycoses: (1) Thrush and sprue (2) Bronchomycoses (3) Tonsillo-mycoses (4) Certain mycoses of the nervous system and organs of special sense (5) Certain mycoses of the urogenital system.

1 *Thrush*—This which is usually ascribed to *Oidium albicans* he finds, may be due to a number of different fungi, and in reality the term thrush does cover a number of clinically similar conditions due to various organisms.

Sprue—He ascribes the frothy diarrhoea to *Monilia albicans*, but does not agree with Kohlschütter in thinking it to be the primary cause of the malady and having regard to this and the fact that Sir James Cantlie has brought forward the hypothesis that it is a deficiency disease, and Sir Leonard Rogers and Nicholl the theory that it is a streptococcus infection, he makes tentatively the suggestion that the term sprue may cover several clinically similar, but ætiologically different conditions: one might be of mycological origin, another of bacterial origin, etc.

2 *Broncho-mycoses*—Bronchial affections due to the higher fungi are quite common in the

tropics and are usually found to be due to the following genera (1) *Nocardia* (2) *Monilia* (3) *Oidium* (4) *Hemispora* (5) *Aspergillus* (6) *Penicillium* (7) *Mucor* and *Rhizo-mucor* (8) *Sporotrichium*

"The severity of these affections depends a great deal on the variety of fungus present. If the condition is of nocardial origin the prognosis is very bad, if of monilia or oidium origin the outlook is less unfavourable, though certain cases terminate fatally. If the affection is caused by a sporotrichium, a hemispora, or in general by fungi which are rapidly influenced by potassium iodide, the prognosis is good."

Clinically these cases resemble closely phthisis of a mild or a severe type, both in symptoms and signs, but examination for tubercle bacillus is constantly negative. A fact well worth remembering whenever sputum in a suspicious case is persistently negative.

In connection with broncho-moniliasis he has found the so-called "tea-taster's cough" and "tea-factory cough" to be due to the tea dusts infecting the respiratory system by means of one or more of these fungi. The tea tasters not only taste infusion, but often fill their hands with tea leaves and bury their nose in them, sniffing them up. The treatment consists in giving potassium iodide, with which glycono-phosphate and balsams may be associated.

3 *Tonsillo-mycoses*—Here the author calls attention to certain acute mycological affections which have not rarely been mistaken for diphtheria—*viz.*, Tonsillar moniliasis, oidionmycosis and hemisporosis and cites some cases in all of which the classical signs of diphtheria including greyish white patches in tonsils, uvula, and pillars of the fauces, the temperature, the frequent slow pulse, the swelling of the lymphatic glands at the angle of the jaw were present, but microscopical and bacteriological examination of the patches for the Klebs-Loeffler bacillus, carried out with the usual technique, using serum-media, etc., remained negative.

4 *Mycotic affections of the nervous system and of organs of special sense*—The author was able to grow an extremely delicate fungus, a nocardia which was gram-positive and partially acid-fast, from the pus of a cerebellar abscess. The colonies had a black pigmentation. Abscesses of the brain and cerebellum due to true actinomyces have been described by several authors.

Organs of special sense—In the eye they produce conjunctivitis with photophobia and purulent discharge, in the nose they give rise to an inflammation of the mucosa and in cases due to *A. niger* minute black dots can be blown out of the nose. In the ear they set up a local inflammation with the usual signs of otorrhoea. The author recommends syringing the ear with hydrogen peroxide 2 parts and alcohol 1 part.

5 *Certain mycoses of the genito-urinary system*—The author's experience in the tropics and in the Balkans may be of interest to the

practitioners in India. He cites three cases of urethritis where a yellow, black or a red discharge was present, but no gonococcus in it. One or other of the fungi was grown from the discharge. A mixture containing potassium iodide, sodium bicarbonate, glycerine, syrup tolu, and irrigations with a solution of perchloride of mercury 1 in 20,000 was sufficient to stop the discharge in a very short time.

"Very similar mycological conditions of the female-genito-urinary organs may be observed, and cases of vaginitis and vulvo-vaginitis due to fungi of the genus monilia, cryptococcus, aspergillus, penicillium, and cladosporium have been recorded, and as the same fungi are found in urethral and vaginal discharge, it cannot be excluded that in certain cases these mycological infections may be contracted by sexual intercourse."

The Repair, by Bone Graft, of Gaps in the Skull due to Congenital Deficiency, Injury, or Operation.

The Glasgow Medical Journal June, 1920
New Series Vol XI—ALEX MACLENNAN,
M.B., C.M., Visiting Surgeon, Royal Hospital
for Sick Children, Glasgow

At the outset the author discusses briefly the question of treating gun-shot wounds of the head by wide removal of bone, and the importance of a rigid covering for the brain in those situations, and recommends the adoption of the autoplasmic bone graft as the ideal solution and supports his conclusion with some favourable cases.

His technique of the inlay of bone is as follows—"The incision follows the line of the scar, which is, if feasible, excised. No special means is taken to control hæmorrhage, such as the use of the elastic or metal tourniquet. The scar and flap must be raised from the region of the gap most carefully so as to avoid opening the subdural space, in many instances it implies splitting the scar on the flat. The detachment of the tissue from the bone margin of the gap must be done in the same manner. The dura must be freed all round the inner surface of the gap margin. The eburnated edge of the gap must be refreshed by rongeur forceps or the sharp spoon. This completes the main part of the operation. The flaps are clipped over a gauze pack, and the region protected by pads. The graft is then procured, and I have latterly utilised the scapula almost exclusively. An incision is made over the infra-spinatus (left) fossa parallel with the muscle fibres which are separated till the bone is reached. The periosteal elevator clears the scapula to the necessary extent. The graft of requisite size and shape is cut out by the osteotome or gouge. The elevator is then inserted under it, and the graft lifted from its bed. To avoid accidents to the graft, I wrap it in a blood-soaked swab and stow it under the wrist of the glove. The separated

muscle and its covering fascia may or may not require subcutaneous suture. The wound is closed without drainage and protected by a strapping dressing. The head wound is then exposed and the graft fitted into the hole, so that it is entirely within the skull, resting between the separated dura and the inner table. It is firmly fixed by the intracranial pressure exerted by the expanding brain. Occasionally, the graft requires trimming or supplementing by small slices from the outer table of the skull. The graft may require to be bent or fractured to ensure a good fit. The skin edges are then sutured over it."

Intestinal Lambliasis

Gaz Ospitali e d Clin 1919 Jan 30 Vol 40
No 9 pp 66—MANTOVANI (M)

THE author does not consider that *Lamblia* is a cause of dysentery, but he believes that it may produce a subacute enteritis manifested by chronic diarrhoea of very persistent type and resistant to treatment. Some cases are recorded of progressive debility terminating in death. The disease was attributed by the author to the action of the parasite. Arsphenamin by its action in improving the general health gave better results than any other form of treatment tried. There was no evidence that the drug exercised any action on the parasites.—*The Tropical Diseases Bulletin*

A Case of Bacillary Dysentery in which Flexner-Y was recovered from the Blood Stream during Life.

Lancet 1919 Sept 13 pp 482-483—BOYD (J S K)

THERE have been sixteen recorded cases of recovery of *B. dysenteriae* from the blood stream during life and the one described here makes the seventeenth. *B. dysenteriae* Shiga has been recorded twice only in this series, so that in this situation bacilli of the Flexner-Y type appear to be the more common. On the other hand, Shiga's bacillus has been isolated post-mortem on 6 occasions. The present instance occurred in Salonika in a soldier with a typical attack of acute bacillary dysentery. The stools were typical and yielded abundant growth of Flexner-Y organisms and identically the same organism was recovered from the blood by haemoculture. The organism was agglutinated 1/1500 by specific serum and gave the classical sugar reactions.—*The Tropical Diseases Bulletin*

Appendicite et hépatite suppurée à balancement dues à l'association coli bacillo-amibienne.

Med Jl Siamese Red Cross 1918 Aug Vol 1
Part 2 pp 163-166—ROBERT (LEOPOLD) & SAKDA (HLUANG)

THE patient, a medical officer, was treated with emetine hydrochloride injections for amoebic dysentery in 1914, and improved rapidly. He was on duty for three years following, till June 1917, when abdominal trouble became marked. On examination evidence of hepatic suppuration and of appendicitis was found. Pus was found on aspirating the liver and on operation an abscess in the right lobe was opened and drained. In the pus numerous amoebae were found as well as *B. coli*. The general condition not improving, and signs of appendicitis with irregular temperature and polymorphonuclear leucocytosis being

observed, an incision was made and an abscess of the appendix was evacuated, in the pus from which numerous amoebae as well as *B. coli* were found.—*The Tropical Diseases Bulletin*

The Recognition of Tropical Sprue in the United States

Jl Amer Med Assoc 1919 July 19 Vol 73
No 3 pp 165-168—WOOD (EDWARD J)

SPRUE undoubtedly exists in the United States, the majority of cases occur in the Southern districts, though one of Wood's cases originated in New Hampshire.

No difficulty should exist in distinguishing the sprue tongue from that of pellagra, in the latter disease it is more pointed and not so flabby. The large size of the stools and the deficiency in absorption of hydrolyzed fats suggests an implication of the pancreas. Pratt and Spooner's analyses show a fat loss of 45 per cent and a nitrogen deficit of 15 per cent. The anaemia of sprue, as has often been remarked, resembles that of pernicious anaemia, a matter of practical interest as that disease may be mistaken for sprue and sprue for it it may be possibly the result of a secondary *B. coli* infection as Charlton has suggested. It is to be hoped that a more accurate study of sprue anaemia will shed some light on the dark corners of the Addisonian disease.

In the discussion of the paper Drs Vanderhoof and Pratt indicated the points of resemblance between the sprue achylia and pancreatic disease, Alvarez of San Francisco expressed his belief in the value of a strawberry diet while Libman of New York, believed that the discovery of the etiology of sprue will clear up the vexed question of the pathogenesis of pernicious anaemia. Graves of Texas is of the opinion that sprue is becoming endemic in the United States and Livingston thinks that betanaphthol may prove to be a cure for the disease.

The Clinical Manifestations of Tropical Sprue

U S Naval Med Bull 1919 July Vol 13
No 3 pp 449-453—WOOD (E J)

SINCE 1915, the number of cases of sprue recognised in the Southern States has increased. It is still being generally confused with pellagra, though the absence of any skin manifestations and grave degree of anaemia, so characteristic of the former disease, ought not to lead to confusion. The mouth condition differs in the two diseases. In pellagra there is marked salivation and the tongue is of a carmine tint. The suffering of a pellagrin from mouth symptoms may be very severe. The stools of pellagra are very different from those of sprue, they are liquid usually more frequent and may occur at any time. In sprue they are large, frothy and occur more frequently in the early hours of the day. The aplastic anaemia of sprue is not found in pellagra.—*The Tropical Diseases Bulletin*

Reduction of Fractures under Radioscopic Control

DIRECT vision of the radiographic shadow is invaluable not only in removing projectiles, but in the more common civil contingencies of fracture and dislocation. The writer has found this method especially useful in reducing a congenital luxation of the hip. Until now, however, one has had to be content with observing shadows thrown from single aspects of the part examined, and in dealing with a fracture, alignment might appear perfect with an antero-posterior ray when lateral observation showed marked backward angulation. Bouchacourt has recently devised an ingenious radioscopic bonnet which, used with two Coolidge tubes gives simultaneous images of antero-posterior and profile shadows. This bonnet

should be invaluable for reducing fractures and for observing the position of the fragments during subsequent immobilisation, without the prejudicial disturbance of patients which is at present required, for example in obtaining profile views of a fractured femur—*The Medical Press*

The Oculo-Cardiac Reflex.

FIRM compression of the eye-balls will in most normal individuals, produce an immediate slowing of the cardiac rate, which decreases by six or eight beats per minute while the compression is maintained. This slowing may be especially marked in cases of exophthalmic goitre and may be diminished or absent in tabes dorsalis. Magitot and Bailliart have recently shown that this reflex is not a truly ocular reflex at all, for they succeeded in obtaining it in the absence of the eye-ball, by injecting the orbit, after enucleation, with gelose. They found that a pressure of 150 to 200 grams were required to produce the reflex, and that increase in the intraocular pressure was without effect. They attribute the nervous phenomena of glaucoma to neuritic changes, not to increase of pressure within the eye-ball. The reflex would thus appear to be orbito-cardiac, the affluent stimuli being transmitted by the fifth nerve, and the efferent passing by the cardiac inhibitory fibres of the vagus—*The Medical Press*

Magnesium Sulphate in Tetanus.

REVERDIN and BEUF (*Lyon Chir*, 1919, 16) publish a brief account of the Blake method of treatment of tetanus. This consists in lumbar puncture, the withdrawal of 10 or 15 ccm of cerebro-spinal fluid and the injection of 10 ccm of warm sterile magnesium sulphate in 10 per cent solution. The drug has anæsthetic and paralysing effects, so that the spasms and convulsions are largely or entirely controlled. The injection into the theca is made daily until recovery is sure, 90 ccm was the largest amount administered to any of the cases in this small series. Treatment with antitetanus serum, morphine, and chloral was employed at the same time, for, although it would be interesting to compare the precise therapeutic value of different treatments, the authors considered that in so grave an affection all known means of attack should be employed. Of five cases treated without magnesium sulphate four died, of six cases treated with magnesium sulphate five recovered. Serum was not given in such large doses as Dean, for example, employed, 30 ccm per diem, given subcutaneously, was regarded by the authors as high dosage—*The B M J*

Cerebro-Spinal Fluid in Syphilis : Prognostic Indications.

IN the *Journal of the American Medical Association*, 6th December, 1919, Dr Joseph McIver gives his results in an investigation of the cerebro-spinal fluid in a series of 91 cases of primary and secondary syphilis. The tests made were the Wassermann reaction, protein determination, and cell count. All the cases selected for examination gave a + + + + positive Wassermann reaction of the blood serum. The average number of cells per cubic millimetre (counted immediately on removal of the cerebro-spinal fluid) was nine. Differential cell counts were not made. Only two cases showed a slight excess of protein in the cerebro-spinal fluid. The vast majority of cases suffered from headache after lumbar puncture, although not more than 4 cc were withdrawn, and the patients were confined to bed for three or four days.

Dr McIver concludes that there is a slight increase of lymphocytes in the cerebro-spinal fluid in the majority of cases of primary and secondary syphilis, and that the increase in protein content does not appear as early as the increase in lymphocytes. He does

not consider that the examination of the cerebro-spinal fluid by present methods is likely to indicate the prognosis, so far as the possible development of neuro-syphilis is concerned—*Douglas K Adams*

Prognosis of Syphilitic Aortitis

IN the above *Journal*, 13th December, 1919, Dr Wm D Reid discusses the prognosis of syphilitic aortitis. His series comprises 61 cases. He concludes that the weight of evidence is against the power of mercury and iodide alone to arrest the progress of the disease. The results so far obtained by intensive anti-syphilitic treatment are promising.

Early diagnosis is obviously of prime importance. Shortness of breath, pain in the chest, or both, were present in all of the cases. Cough was present in 15 of the cases, and cardiac palpitation in 9. Supracardiac dulness was increased in 27 of his cases. In 23 cases there was a V D murmur at the aortic area, in 19 there was a V S, and in 20 both murmurs were present. The average width of the aorta in the 22 cases in which ortho-diagraphy was employed was 7.5 cm. The greatest width was 10.3 cm, and the least 6 cm—*Douglas K Adams*—[*The Glasgow Medical Journal*, June, 1920]

Radiography of the Third Stage of Labour

WEIBEL (*Archiv f Gynak*, March, 1920) has examined radiologically the expulsion of the placenta, and concludes that the frequently expressed opinion that the placenta becomes detached in the majority of cases during the second period of labour is incorrect, this does not occur even in semi-precipitate cases. Detachment may begin in the centre or in any portion, the loosened placenta always leaves the uterus with the edge first, and may or may not be folded. From the form and surface of presentation of the placenta no deductions as to the mode in which it became detached in the uterus can with justice be made. The author suggests that Schultze's and Duncan's modes of expulsion should no longer be described—*The B M J*

Camphor Oil Tumours

HOOKE and WANDER (*Arch, Dermat, and Syph*, March, 1920) direct attention to a condition which may be puzzling unless the history gives a clue to its origin. They have had experience of six cases and they present them as evidence of the danger of indiscriminate use of camphor oil injections for collapse or in the treatment of very severe illnesses. In all probability the lesions are due not to camphor or to the vegetable oil (generally olive) in which it is dissolved, but to the liquid paraffin which has sometimes been used as a vehicle. The effect of paraffin injections has been investigated and it is probable that these camphor oil tumours are of the same nature as the so-called "paraffinomas". In all the cases the condition was first observed some considerable time after injection, in the earliest two weeks and in the latest eighteen months afterwards. They all gave the history that following the injection of camphor oil for a previous severe illness deep tumours appeared, generally on the outer aspects of the lower third of one or both arms, and occasionally in the shoulders, thighs, or breast. The tumours were of months' or years' duration. When not inflamed they showed a doughy or concrete-like infiltration, varying from the size of a walnut to that of an orange, and were generally lobulated. Instead of being rounded in outline they were linear, with definite sharp angles limiting them from the adjacent normal muscular tissue, and bead-like infiltrations of the same character, but smaller, could be traced toward the axilla or around the periphery, simulating secondary nodules of a malignant growth. The skin surface was sometimes elevated and discoloured. Some of the tumours were only discovered by palpation, they lay nearly always deep in the muscle or the connective tissue. The

tumours might not be painful or even tender, when inflamed they were accompanied by colour changes of the skin from red to deep purple. Necrosis was not present in any of the tumours. Histologically they showed the appearance of thrombi of honeycombed appearance, the holes of various sizes, representing globules of oil. Thickening of blood vessels was a noticeable feature in the tumours. No giant cells were found in the particular tumours examined, but examination of others might have been expected to reveal them in abundance. Indeed, in one case at least the pathologist reported the condition as tuberculous, presumably on account of the presence of these foreign body giant cells.—*The B M J*

Zur Fliegenplage in Wohnungen und Lazaretten [The Fly Pest in Dwellings and Hospitals]

Zeitschr f angew Entom, Berlin, III, No 2, 1916, pp 207-209 [Received 19th April, 1920] The Review of Applied Entomology, July, 1920—HAECKER (V)

OBSERVATIONS made by the author show that flies may be kept out of dwellings and hospitals even when conditions are such that all breeding places outside the buildings cannot be entirely destroyed. The habit of flies in general of congregating on sunny walls of dwellings is taken into consideration and by shutting all windows just before the sun reached them and keeping them shut until they were again in the shade, the author was able to exclude these pests entirely from the interior of his house and the same method has since proved successful under hospital conditions.

Detection of Traces of Haemoglobin in Urine

PITICARIU (*C R Soc Biologu*, May 1, 1920), in view of the fact that spectroscopy cannot detect haemoglobin in greater dilutions than 1 in 1,000 suggests treating the urine with Ehrlich's aldehyde reagent for the demonstration of urobilin. If a trace of this reagent be added to a urine containing urobilin or urobilinogen a wine-red colour is produced showing with the spectroscope a single band in the blue. The author found that the urine from two cases of malaria gave the two characteristic bands of oxyhaemoglobin which still persisted after the addition of Ehrlich's reagent but when the urine was diluted a hundred times the bands could no longer be seen on the addition to this diluted urine of the aldehyde reagent the two characteristic bands reappeared. The method was then tested on 12 cases of malaria the urine of which, directly examined by the spectroscope, gave no indication of haemoglobin, after the addition of the reagent the typical bands appeared. It is not necessary to employ fresh urine.—*The B M J* July 1920

The Oculo-cardiac Reflex in Lethargic Encephalitis

U GABBI (*Giorn di Clin Med*, March 1920) examined the oculo-cardiac reflex in four cases of lethargic encephalitis, two of which occurred in adults and two in children. The ordinary technique was used, the pulse rate and sphygmographic tracing being taken before, during, and after ocular compression and the blood pressure before and after. The compression lasted ten seconds. The results were as follows: (1) The pulse rate sank on the average from 88 or 90 to 60 or 62, and the pulse became stronger and irregular. (2) The blood pressure after the compression fell from 90 to 82, (3) the sphygmographic tracing during the compression showed a higher ascending line and more marked oscillations. One of the children showed pallor, mental confusion, nausea, and a tendency to vertigo. Injection of 1 mg atropine in adults and $\frac{1}{2}$ mg in

children had the following results: (1) Before ocular compression the pulse rate increased, and vasomotor changes appeared in the face, (2) during compression the pulse rate fell from 90 or 88 to 82 or 80, (3) the sphygmogram showed the same changes as before the injection. Exaggeration of the oculo-cardiac reflex in lethargic encephalitis is attributed by Gabbi to hyperexcitability of the vagus centre in the medulla.—*The B M J*, July, 1920

Reviews.

KALA-AZAR—By RAI BAHADUR UPENDRA NATH BRAHMACHARI, M A M D, with a foreword by Major-General W H B Robinson CB, KHS, FMS. Second Edition. Calcutta Messrs Butterworth & Co. Price Rs 7

We congratulate the author on the appearance of a Second Edition of his book on Kala-Azar. The First Edition was rapidly exhausted and we venture to prophesy that the present edition will share the same fate.

This Edition may be described as the most comprehensive work extant on Kala-Azar. Geographical distribution, history, epidemiology, symptomatology, diagnosis, prognosis and treatment are all exhaustively dealt with. While giving a faithful account of the researches of others and the opinions of the leading authorities, the subject matter is replete with accounts of the author's own researches. The language is clear, concise, and of a high literary order. The illustrations and plates are particularly well executed and worthy of the high reputation of the publishers.

If one were to single out any part of the book for special praise, one might select the chapters on treatment, specially those which deal with the different preparations of Antimony. The Pharmacology of the various salts of this metal is very fully dealt with, new compounds prepared under the author's directions described, and the lines, along which further advance is likely, indicated.

We can strongly recommend this Edition to medical men throughout the Tropics.

THE X-RAY ATLAS OF THE SYSTEMIC ARTERIES OF THE BODY—By H C ORRIN OBE F.R.C.S. (Edin). London: Ballière Tindall & Cox. Price 12/6 net.

THE plates which constitute the main feature of this atlas are simply Skiagrams of the arterial system filled with opaque (to X-Rays) material. Most of the radiographs were taken from a full time foetus.

The excellence of the radiographs and the superb manner in which they show the finer branching of the arteries is beyond question. The anastomoses about joints are particularly well shown. The method of indicating the various branches is original and effective. Whether, as the author hopes, it will prove of great value to the student of Anatomy is another matter which time can only decide.

We congratulate the author and the publishers on having produced a novel and interesting

work which should prove useful not only to the student, but to the Physician and Surgeon

THE DUTIES OF SISTERS IN SMALL HOSPITALS—By FELICE NORTON London Baillière, Tindall and Cox Price 4/6 net

THIS book is likely to be very helpful to any nurse wishing to take up a Sister's post after her training. The whole matter is short, concise, and to the point, and fully points out the duties of a Hospital Sister. The chapters on the duties of a Theatre Sister and of a Night Sister are particularly good and useful.

PRACTICAL PHARMACOLOGY FOR THE USE OF STUDENTS OF MEDICINE—By W. E. DIXON, M.A., M.D., F.R.S. Printed at the Cambridge University Press Price 7/6 net

THIS little book contains an account of the experiments which a student can easily perform for himself in class.

The experiments have been chosen as far as possible to illustrate well recognised actions of common drugs in every day use. Before dealing with the actual experiments a brief theoretical account has been given, to impress on the students the significance and the practical bearing of the experiments he performs.

A feature of the book is a table of the doses of various drugs for the commoner animals used in the Laboratory.

The author deplores the fact that owing to legal restrictions, he is unable to include experiments on decerebrate mammals.

On the whole it is an admirably conceived little book and should prove useful to students and others studying the action of drugs.

WAR AGAINST TROPICAL DISEASES—By SIR ANDREW BALFOUR C.B., K.C.M.G. Director in Chief, Wellcome Bureau of Scientific Research, Baillière, Tindall & Cox, London 220 pp., with 183 plates and illustrations 12/6 net 1920

"SANITARY SERMONS" are apt to provide very dull reading. Sir Andrew Balfour's series of seven, however, come into a very different category. They are such delightful reading and so beautifully illustrated that, in the first instance, they should be read and appreciated in the comfort of an armchair. The stories of the susceptible sanitary inspector, of the generous lady friend, who would sit out with bared neck in the late afternoons in order to attract phlebotomy, and of the distinguished Highland regiment at Salonika which contained 52 Private John Macphersons who were all afflicted simultaneously with red hair and the itch, are in the author's most happy vein. The book is full of "bons mots"—"Phlebotomus papatasi, hairy as Esau", "Simulium damnosum, evidently the misbegotten progeny of a female Culex and a deformed house fly", the difficulty experienced by military authorities in distinguishing between sanitation and latrines, which are apt to be regarded as synonymous, the urine funnels in the desert, mistaken by the enemy for listening posts, the sanitary inspector's work, like a

woman's, never finished, but probably more productive of good results.

At the second reading pencil and notebook are essential. The book is full of the most valuable and suggestive information. Cut bamboo stems as breeding places for anopheline larvæ, the value of Notonecta, the water boatman, as predatory upon mosquito larvæ, the typical facies of severe ankylostome infection, the red howler monkey as a possible reservoir of yellow fever infection, the value of underground larders in desert campaigns, the open-air-cage fly trap and the roller towel method of using arsenite of soda solution for killing flies, Egypt as an international health filter, the importance, in anti-hookworm campaigns, of attending to the breeding places of larvæ as well as to the infected patients, the necessity for inspection and control of pharmacies, improvised shower baths and the use of churns in chlorinating water, the proper construction of field service kitchens, are a few of the very many subjects most ably dealt with.

The book consists of seven main chapters. "Some Aspects of Tropical Sanitation" is a compend of the duties and training of a Sanitary Inspector, and urges the value of British N.C.O.'s in such appointments. "Tropical Problems in the New World" is the story of an itinerant sanitarian possessed of both the sanitary eye and the sanitary nose, through Columbia and the West Indies. "Preventive Inoculation against Typhoid and Cholera" is a popular address to the Research Defence Society. "The Medical Entomology of Salonika" is an entirely admirable lecture, covering exactly the ground which all medical men practising in the tropics should know thoroughly, without being overburdened with detail, and is most clearly written and illustrated. "Sanitary and Insanitary Makeshifts in the Eastern War Areas" is full of fertile ideas and devices. "The Problem of Hygiene in Egypt" is fully dealt with and the author gives a valuable summary of the present medical and sanitary organisation and an outline of how a Ministry of Health should be organised and run. "The Palm from a Sanitary Standpoint" is an essay full of the most detailed, erudite and curious wealth of information.

"War against Tropical Diseases" is an admirable book and a most valuable contribution to the growing volume of post-war books dealing with tropical medicine. It only remains to add that the binding and the wealth of illustrations are characteristic of the very high standard set by the Wellcome Bureau of Scientific Research, and will render the book treasure-trove to its readers.

AIDS TO OSTEOLOGY—By PHILIP TURNER, B.Sc., M.B., M.S. (Lond.), F.R.C.S. Second Edition London Baillière, Tindall & Cox Price 4/6 net

As a summary of its subject this book should have no rival of its size. It is

unnecessary to dilate on the utility of the aid series of publications, already so well-known and so widely read by students and others. The present volume embodies all the good points of the series.

PRACTICAL CHEMISTRY INCLUDING SIMPLE VOLUMETRIC ANALYSIS AND TOXICOLOGY—By P. A. ELIIS RICHARDS F.R.C. London: Baillière, Tindall & Cox. Price 5/- net.

AN excellent little book specially written for medical and dental students, but, also intended to provide the general student of Chemistry with an introduction to elementary qualitative and quantitative analysis. That it should have already reached a third edition is a sufficient indication of the utility and popularity of this little volume.

BAILLIÈRE'S NURSES' COMPLETE MEDICAL DICTIONARY Second Edition. By CONSTANCE M. DOUTHWAITE. London: Baillière, Tindall & Cox. Price 3/- net.

THIS little volume should prove indispensable to every nurse qualified or unqualified. It contains practically every medical term which a nurse is likely to hear on her daily rounds and still it is small enough to be carried in her pocket.

A useful feature of the book is an appendix containing abbreviations of medical terms used in Prescriptions, Degrees, Diplomas, Naval and Military Medical terms, Symptoms and Treatment of Poisoning and other valuable information.

A CLASS-BOOK OF ORGANIC CHEMISTRY, Vol. II—By J. B. COHEN, PH.D., B.Sc., F.R.S. London: Macmillan & Co.

THIS little volume is intended for Medical Students who can devote only a limited time to Organic Chemistry. Theory is combined with practical illustrations. The high reputation of the author is a sufficient guarantee for the subject matter, and we can recommend it to all students who require a short, concise account of the main facts of Organic Chemistry.

NEOPLASTIC DISEASES. A Text-book on Tumours. By JAMES EWING, A.M., M.D., Sc.D. Pages 1027. Illustrations 479. Published by W. B. Saunders & Co. Philadelphia and London. Price Rs 37/8.

THIS volume, which is probably the most complete monograph on the subject in our language, opens with an interesting historical summary from the early Egyptian period to the present day.

The classification, which is simple and reasonable, is based on histological characters. Throughout the book the author lays stress on the fact that tumours of the same histological type are by no means identical when occurring in different parts of the body, but rather that each organ impresses on the neoplasms which arise in it some difference either in their formation or in the clinical symptoms to which they give rise. Thus fibromata though identical in structure run a very different course according to the part of the body in which they happen to arise.

The chapter on the general characters of

malignancy is particularly good, and the subject is brought so far up to date as to include the recent work of Febiger on spontaneous cancers in rats due to the invasion by the nematode *Spiroptera neoplastica*, which is believed to be carried by cockroaches.

A full description is given of the results of recent cancer research and on the relationship of malignant disease to Mendelism and genetics. The characters of that difficult class of tumours which arise in lymphoid tissue and which includes lymphoma, leukaemia, lymphocytoma, chloroma and lymphadenoma, are described more clearly than in any other work we know, and the author has produced something like order out of the chaos which generally surrounds this class of tumour.

One of the most valuable parts of the book is the consideration devoted to the clinical side, and to the signs whereby the surgeon may recognise the change from chronic inflammation to early malignancy in such conditions as chronic mastitis.

Statistical evidence on various tumours from the surgical point of view is also freely given, such as their relative frequency in different organs and in different parts of the same organ.

The ovarian and the broad ligament tumours are described very fully and excellent diagrams are given to shew the relation of vestigial remains to the neoplasms of this locality.

We note that the writer abandons the theory of the endothelial origin of the common tumours of the salivary glands though this has almost passed into general acceptance.

Melanotic tumours are removed from the sarcomata and are placed in a separate class as "melanomata" and evidence is given to shew that they arise from the chromatophores.

The final chapter deals with the teratomata, dermoids, and other tumours of embryonic origin, and with malformations.

The book is profusely illustrated, mostly with photomicrographs which are very clear and nearly all new. The diagrams also are used to shew special points of vestigial or embryonic interest.

It is difficult to find anything but praise for the book which is certain to become the standard authority on neoplastic disease.

It is printed and got up in the way we are accustomed to expect from the firm of Messrs W. B. Saunders and Company.

DIAGNOSIS OF BACTERIA AND BLOOD PARASITES—By E. P. MINETT M.D., D.Ph., etc. Third Edition. London: Baillière Tindall and Cox. Price 4/6 net.

AN excellent little book containing all the really essential points of practical Bacteriology, this volume should prove of special value to the student and practitioner. The present edition has been thoroughly revised and brought up to date. It includes such subjects as demonstration of Negri bodies, filter passers, Rickettsia bodies, etc. No student or practitioner should be without it.

AN OUTLINE OF GENITO-URINARY SURGERY—By GEORGE GILBERT SMITH, M.D., F.A.C.S. Published by Messrs W B Saunders Co, Philadelphia and London

THIS is an excellent little volume full of practical and useful information. It meets with all the requirements of a student and will be found to be of great value to the general practitioner, both in his emergency and ordinary routine work. The author is eminently practical, lucid and precise in his conception as regards the symptomatology, pathology and treatment of genito-urinary conditions. The illustrations are such as are seldom met with in ordinary books dealing with genito-urinary affections. We congratulate Dr Smith on the production of a neat and useful work which we strongly recommend to the medical profession.

THE NEW PHYSIOLOGY IN SURGICAL AND GENERAL PRACTICE.—By A RENDLE SHORT, M.D. B.S., B.Sc., F.R.C.S. Fourth Edition Revised and enlarged. Bristol, 1920. John Wright and Sons, Ltd. Price cloth, 9s 6d, paper, 7s 6d net.

THAT this little work is of distinct value to the general practitioner is proved by its having attained to its fourth edition. It brings together a mass of important facts, collected by patient search and by patient co-ordination rendered intelligible and made useful for practice. The next edition, which will soon be called for, will we hope be more thoroughly revised equally in all chapters than this appears to have been. Alderhalden's work is now not nearly so much admired as it was before the tests of time and experience had been applied to it. Since 1913 McCarrison has published a lot of work on Goitre which finds no place in this book.

THE MEDICAL ANNUAL—A Year-book of Treatment and Practitioner's Index. Bristol, 1920 (Thirty-eight year). John Wright and Sons, Ltd.

THIS well-known and most useful year-book is up-to-date. In it the busy practitioner will find hints for the treatment of all and sundry complications that may arise, and carefully condensed descriptions of the latest methods of diagnosis, and of treatment. No practitioner should be without it, for no practitioner can afford to do without its ready aid in his practice.

A DIABETIC MANUAL FOR THE MUTUAL USE OF DOCTOR AND PATIENT.—By ELLIOTT P. JOSTIN, M.D. Assistant Professor of Medicine, Harvard Medical School. Second Edition, thoroughly revised. Philadelphia and New York, 1919. Lea and Febiger.

THIS little work contains all that the most intelligent and exacting patient requires to know about his diet, and why restrictions of it are necessary. Full tables of the carbohydrates, protein and fat contents with the caloric-values of the usual articles of diet are given, and very careful directions as to the weighing of these. Interspersed are wise sayings which the patient will do well to bear in mind, and to carry out in practice. As might be expected the author prefers the metric system of weights and

measures. A very valuable section is that which gives the real carbohydrate content of so-called diabetic preparations—one "Diabetic Flour" had 71.9 per cent. We recommend this work to all who have diabetic patients, and who has none here?

MANUAL OF SURGERY (ROSE and CARLESS) FOR STUDENTS AND PRACTITIONERS.—By ALBERT CARLESS, C.B.E., M.B., M.S., F.R.C.S. Tenth Edition. Pp. xii 1562. Baillière, Tindall and Cox. Price 30s net.

THE tenth edition of this well-known book needs no introduction to the student or the practitioner. The new volume is in every respect a most admirable text-book, up-to-date, comprehensive, and well-illustrated. The author has included a great deal that the war has taught us, particularly in the chapters on compound fractures and infected wounds. The X-ray plates on art paper have been collected together at the end of the book and form a valuable appendix.

The volume is of necessity increased in size and in price. It is a most satisfying product of 21 years of effort, and the war experiences of the author during the five eventful years which have passed since the publication of the last edition are incorporated in the book.

CHEMISTRY FOR PUBLIC HEALTH STUDENTS.—By E. GABRIEL JONES. Methuen & Co. Price not stated.

WE have read this work with very great pleasure. The author's object has been to produce a handy work for public health students which is mainly a laboratory manual. The practical directions are excellent and give evidence of much experience, and no student following his methods should have any difficulty in obtaining accurate results. We fully agree as to the necessity of thoroughly explaining chemical calculations, as even good students frequently fail to understand them properly. We are glad, too, to see the constant references to original writings and methods, which are so rare in many text-books. We do not think anything is gained by detailing at the head of each experiment a list of apparatus required, since for the most part these are the common-places of the laboratory. The author is rigid in his exclusion of all cuts and diagrams, even of special pieces of apparatus such as the Butyro-refractometer and the standard Reichert-Meissl-Polenske apparatus.

A short account might have been included of the general methods of oil analysis, and this would have formed an appropriate introduction to the chapter on butter, as the two subjects are so closely connected.

We have nothing but praise for this book, which every laboratory should possess.

TOXICOLOGY (Catechism Series)—Second Edition. Author not stated. E. & S. Livingstone. Price 1s 6d.

THIS, another of the well-known Catechism Series, is very welcome. Within the modest

space of 73 pages the author succeeds in presenting the most important points regarding symptoms, lethal dose, antidotes, post-mortem appearances, etc., of the more common poisons. The accounts are clearly given and well suited to the requirements of students and junior practitioners.

The account of the chemical tests is not so good. In a general work of this kind analytical methods naturally take second place, and it is a matter of the greatest difficulty to give in a few words any clear idea of the tests which are actually used. This makes it all the more necessary to cut out academic information which has no practical application, such as we find under the heading of nitric acid, where it is stated that 'mixed with concentrated hydrochloric acid it dissolves gold'. The only test given for ammonia is Nessler's Test. No doubt this can be applied to viscera after distillation.

It is stated under the heading of poisoning by the alkalis that "the vomited matters are alkaline," but under the heading of ammonia poisoning no mention is made of the three characteristic signs *viz* (1) strong alkalinity to litmus (2) characteristic smell and (3) fumes with hydrochloric acid. Also the statement that perchloride of iron gives a "blue" colour with carbolic acid is not accurate.

Despite a few blemishes of this kind the book contains much useful general information on the subject of poisons and we can recommend it.

CEREBRO-SPINAL FLUID IN HEALTH AND DISEASE—
By ABRAHAM LEVINSON, B.S. M.D. 231 pp. 56 illustrations including 5 coloured plates. London 1919.
Henry Kimpton. Price 18s net.

The author, after having done many hundreds of lumbar punctures, states that, although for children up to 12 years of age a needle 4 cm long will certainly penetrate the spinal canal, for adults the needle must be 10 cm long to allow for the great depth at which the canal lies in very fat subjects, and that failure to obtain fluid may nearly always be ascribed to faulty technique. The patient should always be in the recumbent posture, with the back arched in order to widen the intravertebral space, and though in children the puncture may be made exactly in the middle line for adults one should thrust the needle in 5 to 10 mm to the side, as Quincke, who did the first lumbar puncture for therapeutic purposes in 1891, laid down.

The following rough and ready tests he mentions amongst the more elaborate tests required for a full knowledge of the condition of the cerebro-spinal fluid—*Foam*—in normal fluid this is but slight after shaking and disappears in a few minutes. *Turbidity*—if produced by the addition of sodium hydrate, but not by adding sulphuric acid, indicates tuberculous meningitis, the turbid fluid of suppurative meningitis being unaffected by sulphuric acid, but cleared up by sodium hydrate. *Pellicle*—this may form very early after the fluid is drawn in

suppurative meningitis, but does not appear until several hours have passed in tuberculous meningitis.

As a rule, no more than 10 c.c. of fluid should be withdrawn—2 c.c. should be received in one test-tube, and of this quantity 1 c.c. is used for the permanganate test, and 1 c.c. for smears, cultures, and cytological examination. In a second test-tube 3 to 5 c.c. should be taken, and examined for globulin, and by the Lange and Wassermann tests. A third test-tube receives the rest of the fluid removed. In cases of meningitis, owing to the increase in the quantity of fluid from 15 to even 40 c.c. may be removed due attention being paid to the pulse while the fluid is flowing.

The author believes that Lange's gold chloride test is of value not only in detecting various forms of syphilis of the nervous system but also in discovering the type of meningitis.

He does not recommend the French method of cell-counting, because, though it is more convenient for a rough estimation of the number of cells and allows one to study the type of cell present on the same slide, it requires a larger amount of fluid than does the chamber method, and gives less accurate results. He prefers the Luchs-Rosenthal to the Thomas-Zeiss chamber.

For measuring the pressure of the fluid he has devised a special needle which fits on to a manometer whose tube is 800 mm long, this being the highest pressure obtained of all his estimations. He does not recommend a mercury manometer for in normal conditions the pressure thus recorded is too small, seeing that 1 mm of mercury equals 13 mm of water.

In the treatment of meningococcus meningitis he, as we might expect, pins his faith on the intraspinal injection of antimeningococcus serum. Indeed he goes so far as to say that in every case in which turbid fluid has been obtained on puncture, "antimeningococcus serum should be injected immediately on the probability that the case is one of epidemic meningitis." He believes that it is best to administer 30 c.c. of serum if so much can be removed, if only 15 or 20 c.c. can be removed, then 20 c.c. should be injected. And he adds "I believe that the principle of diphtheria antitoxin, that as much serum as possible be given at one time, can be applied with the same beneficial effects, to the administration of antimeningococcus serum." He recommends that as long as bacteria are present, cells are numerous and the patient's temperature is high, the serum should be administered twice daily. "It has been my plan to administer 30 c.c. of serum the first time, 30 c.c. the second, third and fourth times, making 120 c.c. in all, irrespective of the cerebrospinal findings. Then if the temperature continues high and the cerebrospinal fluid shows the presence of many cells, after waiting one day I administer 30 c.c. additionally even if no bacteria are present. I then wait two days longer, and if the case shows no change for the better I administer 30

c.c. more" To clinch his argument he gives details of a case which died of cerebrospinal meningitis. His reports end "If the patient had received sufficient serum, she would most likely have recovered from the disease and remained well." She had had only 45 c.c. of serum, because the physician decided that as bacteria had disappeared from the fluid no more was needed.

He believes that the Swift-Ellis treatment of syphilis of the nervous system (by injection of the patient's own serum taken one hour after he has received an intravenous injection of N A B) is of use, but must be carefully carried out so as to avoid infection of the theca and suppurative meningitis.

Altogether a most admirable work, which shows how hard the author has worked to advance our knowledge of the cerebrospinal fluid.

PHYSIOLOGY OF THE CENTRAL NERVOUS SYSTEM AND SPECIAL SENSES—By N. J. VAZIFDAR, L. M. & S. Third Edition. Thoroughly revised and enlarged, with 18 illustrations. Bombay, 1920. S. Govind & Co. Price Rs. 3/12.

THIS little book, which has been carefully revised and enlarged, is thoroughly up to date. It is not intended to take the place of exhaustive books on the subject, but is meant to be read as a brief resume of the subject. It is in fact, a rehash of the standard text-books. This, however, does not detract from its value as an introduction to the physiology of the central nervous system for students for whom it is intended. It can be confidently recommended as a book to be read with a course of lectures. The type is large and clear and the illustrations excellent. The price should be within the means of the average student. On the whole, the author may be congratulated on having produced a book of distinct utility to the Indian student.

DISEASES OF THE EYE (Catechism Series)—By WILLIAM GEORGE SYM, M.D., F.R.C.S.

PHYSICS, Part I Second Edition. Zoology, Part I. By ROBERT A. STAIG. Edinburgh. E. & S. Livingstone. Price 1s 6d net, each part.

It is unnecessary to dilate on the character of this well-known series of publications. Suffice it to say that they have been thoroughly revised and brought up to date.

Their chief use would seem to be for rapid revision of a subject by students and others about to sit for examinations.

RADIOGRAPHY IN THE EXAMINATION OF THE LIVER, GALL-BLADDER AND BILE DUCTS—By ROBERT KNOW, M.D. London. Wm. Heinemann, Ltd. Price 7s 6d net.

This work should be in the hands of every Radiologist. It is a complete study, from the radiological point of view, of the liver, gall-bladder, and bile ducts. The opening pages are concerned with anatomical details. The book is profusely illustrated with diagrams, photographs and excellent skiagrams. It should prove useful not only to the Radiologist, but also as a

work of reference for the practising Surgeon or Physician.

HALF A CENTURY OF SMALLPOX AND VACCINATION—By JOHN C. McVAIL, M.D., LL.D., Edin. (1919). E. and S. Livingstone. Price 5s 6d net.

We here in India need no written proof of the efficacy of vaccination, for we can read the proof in the freedom from loss of eyesight due to smallpox which the younger generation enjoys as compared with the older generation. Still we may read with pleasure this work which is based on the Milroy lectures delivered before the Royal College of Physicians in 1919 by the veteran protagonist of vaccination. He insists on the necessity of re-vaccination, so do we. Let those who have India's commercial prosperity at heart see to it that her ports are not allowed to become infected because only primary vaccination is compulsory. The erstwhile capital has had a severe lesson—let it profit by it.

A TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY—By Rai Bahadur JAISING P. MODI, L.R.C.P. & S. (Edin.), L.R.F.P.S. (Glas.) London, 1920. Butterworth & Co. Price Rs. 10 net.

THIS is not a text-book, for it does not contain a single reference whereby the statements made in it that are culled from other works may be verified. It presumably represents the teaching of Dr. Modi, who is lecturer on Forensic Medicine at Lucknow, and what it teaches regarding the examination of the individual in cases of assault, rape, etc., and the cadaver in cases of violent death, is good. The section on toxicology is also good. That on insanity requires to be rewritten by a man who is in touch with modern psychiatry for, however much the differentiation of insanity into monomania, moral mania and the like may accord with the practice of fifty years ago, and the knowledge of the legal profession of to-day, it is not well that students should not have the opportunity of learning what progress has been made in the last half century in this subject. It is not well that they should be taught that "sexual excess, mental worry and overstrain" cause general paralysis. If ever a second edition of this work appears, the author should have its English thoroughly revised, and the proofs read and supervised by some one who is thoroughly conversant with such work, for as it stands, this work abounds in very bad English and contains not a few really appalling misprints.

Correspondence.

PRELIMINARY NOTE ON THE TREATMENT OF LEPROSY BY ANTIMONY

To the Editor of THE INDIAN MEDICAL GAZETTE

SIR,—Since the discovery of antimony as a specific in Kalazar and other allied diseases, we have treated some

crises of leprosy with tartar emetic and antimony sodium tartrate. It seems to us that in the crises treated by us there has been a remarkable improvement in the condition of the patients and especially so in most of the malarial crises. It is too early to draw any definite conclusions but it appears to us that so far the results are quite encouraging. The results of our further observations will be communicated later on.

Yours, etc.,

UPLANDRA NATH BRAHMACHARI,

M. A., M. D., Ph. D.,

Teacher of Medicine

Campbell Medical School

Calcutta

NADAN M. DUTT, L. M. S.,

Teacher of Physiology,

Campbell Medical School,

Calcutta

CAMPBELL HOSPITAL,

CALCUTTA

1st August, 1920

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR—As regards the enquiry of An Inquirer in your issue of this month I would venture to think that quinine is the medicine for malarial fever in pregnant females. There is a greater risk of miscarriages or abortions from the fever than from the action of the drug.

During the last six or seven years there have been many cases of malarial fever in and about the town of Shillong (Assam). In the first pregnant case in which I was forced to give quinine I did so with great trepidation. Since then I have treated at least fifty pregnant cases with quinine and without the least untoward symptom in any. The form in which I generally administer it is quinine hydrobromide gr. v—x pot. brom. gr. v—x acid hydrobromide dil. in x—xx in chloroform water two or three times a day and if necessary with tinct. euonymi and tinct. hyoscyami and during the last three years I have been using a 5 per cent. solution of quinine acid hydrobromide in normal saline intravenously whenever possible.

I would also refer him to case No. 12 in the article by Maj. R. Knowles L. M. S.—my former chief—in the *Indian Journal of Medical Research* vol. v No. 3 January 1915 the case of a European lady in the 7th month of pregnancy who was treated with quinine both intravenously and by the mouth.

Yours etc.

RAMTARAN SEN

Asst. Surgeon

SHILLONG 25th August 1920

To the Editor of THE INDIAN MEDICAL GAZETTE.

SIR—In reply to your correspondent Enquirer of Bangalore in my limited experience the exhibition of quinine in pregnancy is best effected by intravenous injection of comparatively small doses i.e. 5-10 grains of the bihydrochloride dissolved in 20-40 m. of fresh sterile distilled water. This can be given without any inconvenience to the patient with a glass hypodermic syringe. Two doses on successive days is usually sufficient to stop fever.

Quinine given intravenously is about six times as active a haemamebicide as that given by the mouth as it circulates in a much larger proportion as an organic compound loosely combined with the blood proteins instead of chiefly as an inorganic solution. For this reason a small dose by the vein is as effective as a much larger dose by the mouth and thus the toxic effects of large quantities in circulation is avoided. I have never seen cinchonism after intravenous injection and the reduction of the size of the spleen is remarkably rapid.

One need not attempt a radical cure in a pregnant woman, the object being to keep the disease in abeyance during pregnancy and lactation.

Yours etc.

W. C. SPACKMAN,

Capt. I. M. S.

DIARRHŌEA CANTONMENT

26th August 1920

To the Editor of THE INDIAN MEDICAL GAZETTE

SIR—Referring to the letter by Mr. Singh in the July issue of *Indian Medical Gazette*, relating to the destruction of mosquitoes I hope the following observation of mine will not be out of place in your esteemed Journal.

The quarter in which I am at present resident, is a fairly decent one from a sanitary point of view, surrounded by coconut trees as is often the case in Malabar. There are more than 3 or 4 dozen of these small bats of course untamed—for I must admit my ignorance in the art of taming these birds—which find a convenient resting place between the roofing tiles and the ceiling planks. These beasts or birds whichever they may be get out at night and frequent all the rooms in the house. Almost all of them can be seen hanging from the ceiling throughout the night getting out occasionally through the windows in search for their prey.

In spite of this large number of bats there are a good number of mosquitoes in the house no special breeding ground being present near by. Hence in my opinion these bats cannot in any way do away with the necessity of having curtains, on the other hand I have often found that these dirty little creatures are a sort of nuisance as they defecate and urinate all over thus fouling the atmosphere and disturbing the hard-earned rest of a doctor by their humming and screaming noises.

Yours etc.

P. A. NARAYAN IYER

Sub Assistant Surgeon

Princess of Wales Dispensary

KALLASS 15th August 1920

To the Editor of THE INDIAN MEDICAL GAZETTE

SIR—Certain observations contained in the article entitled 'The Superfluous Woman' contributed by Captain H. F. Stephens L. M. S. to the August number of the *Indian Medical Gazette* would appear to me to challenge criticism. It is evident that Captain Stephens is justified in dismissing as wholly unsatisfactory the solution proposed by *The Lancet* for maintaining a less disproportionate ratio between the sexes in those countries of Europe which were subjected in the recent war to so grave a depletion of their male population but in regard to Captain Stephens' summary condemnation of Dr. Carnot's proposals one would like to know on what grounds Captain Stephens holds that the proportion of one human male to one human female is the 'natural' ratio. It is presumed from the context that this remark refers to the sexual relations of the two sexes. If this is so most people will agree with him that monogamy—by which is understood the more or less prolonged cohabitation of two individuals of opposite sex—has been the prevailing type of sexual relationship among the higher vertebrates and through the greater part of human history. Nevertheless the history of mankind appears to indicate that this does not exclude the fact that variations occur. Indeed it assumes them. The history of mankind also points to the fact that when and where these deviations from the monogamic order among human beings do occur they are solely conditioned by social and economic environment and are not at all the outcome of a polygamous instinct in the human male as for instance Lord Morley would have us believe, (*Diderot and the Encyclopaedists* Vol. II p. 20) unless of course we are to interpret his statement to mean that man is an instinctively monogamous animal with a concomitant desire for sexual variation—which is an entirely different matter.

Hence, it is not particularly obvious why Captain Stephens comes to regard temporary polygamy as theoretically unsound. Practically, as Captain Stephens observes, there might be obstacles to the establishment of such an institution in France, unless, of course, the French Government are able and willing to make it possible financially for a man to support the offspring of a plurality of wives. Captain Stephens condemns miscegenation as "wholly wrong," but gives no reason for so doing, so that one is at liberty to suppose that his opinion on this extremely complex problem is based (as indeed the opinions of most people are based), merely on prejudice. As Westermarck has pointed out (*History of Human Marriage*, p. 376), one of the boons conferred by our civilisation is that while it has narrowed the inner limit within which a man or woman must not marry, it has widened the outer limit within which a man or woman may marry. Since race-pride, caste-pride and most of all, religious intolerance, have kept up that feeling in favour of endogamy which has developed under past conditions, it is only by slow degrees that new ideas can become strong enough to release mankind from these ancient prejudices. It would be a matter of great psychological interest to learn if the French mind is at the present moment capable of taking a sufficiently objective view of this question to enable this experiment to be made on a fairly large scale, for in spite of the dogmatic assertions to the contrary made by *de Gobineau* (*l'Inégalité des Races Humaines*), it has yet to be proved that racial inequality is anything but an infirmity of the human race, and not, as is generally believed, a fundamental principle of it.

Lastly, one cannot help experiencing a feeling of surprise at the view expressed by Captain Stephens that "the present unrest in public morals is the reaction of war, and will vanish as suddenly as it appeared when the nervous health of the nations resumes the normal." One must assume that Captain Stephens intends that the term "morals" should here connote sexual morality. I think that the ordinary student of psychology is more likely to hold the opinion that this laxity in sexual morality to which Captain Stephens calls attention, is more likely to turn out to be the expression of an increase of that intolerance of isolation which is the normal reaction among gregarious animals when suddenly threatened by an external danger "Loneliness," as Wilfrid Trotter observes (*Instincts of the Herd in Peace and War*, p. 140), "becomes an urgently unpleasant feeling and the individual experiences an intense and active desire for the company and even for physical contact of his fellows." The necessity for companionship was strong enough to break down the distinctions of class, and dissipate the reserve between strangers which is to some extent a concomitant mechanism. Again, it is perhaps, possible that when Captain Stephens speaks of "morality" (sexual or otherwise) he confuses several distinct types of morality, the "theoretical" morality, about which the Socratic dialogues were so deeply concerned, and which was divided into "traditional" and "ideal" morality (of which latter Nietzsche in modern times has been such a conspicuous champion), and "practical" morality which is really the fundamental and essential morality (Havelock Ellis, *Psychology of Sex*, vol. VI, p. 368).

If my supposition is correct, Captain Stephens appears to have overlooked the fact that the actions of a community are determined by its vital needs, so that, if the need of France (or any other country), for more males is sufficiently imperative, it is certain that any, or even all, of the methods to counteract this deficiency suggested by Dr Carnot will be tried, however "egotistical" the womanhood of the country may be. It is a fundamental principle of psychology that as the feeling of the herd increases in favour of any particular line of action, the existence of any feeling hostile to the accomplishment of such an ideal will correspondingly diminish.

Yours, etc

OWEN BERKELEY HILL,

Major, I.M.S.

RANCHI, 25th August, 1920

Service Notes.

LIEUT.-COL. J. W. D. MEGAW, M.B., I.M.S., Principal and Professor of Pathology, King George's Medical College, Lucknow, is granted furlough for three months in continuation of vacation leave for three months, with effect from the 1st May, 1920.

THE undermentioned officers are permitted, subject to His Majesty's approval, to resign their temporary commissions, with effect from the dates specified—

Khaliq Dad, dated 1st November, 1919

Bhola Nath, dated 3rd November, 1919

Mohammad Afyat Khan, dated 25th May, 1920

MAJOR A. S. M. PEEBLES, Indian Medical Service, is appointed to officiate as an Agency Surgeon, and is posted as Residency Surgeon, Bushire, with effect from the 1st June 1920.

CAPTAIN L. A. P. ANDERSON, Indian Medical Service, is granted, subject to His Majesty's approval, the temporary rank of Major while holding an appointment as Deputy Assistant Director, Medical Services, Medical Branch, Army Headquarters, dated 6th June, 1920.

LIEUT.-COL. J. C. S. VAUGHAN, I.M.S., was granted combined leave for eight months and sixteen days, *vis*, privilege leave for five months and three days and furlough on average salary for the remaining period under Article 260 of the Civil Service Regulations and Government of India, Finance Department, Nos. 168-C.S.R., dated the 24th February, 1919, 1514-C.S.R., dated the 29th December, 1919, and 16-C.S.R., dated the 9th January, 1919, with effect from the 8th May, 1920.

This cancels Notification No. 73-M.R., dated the 19th April, 1920.

LIEUT.-COL. S. ANDERSON, I.M.S., Civil Surgeon of Purnea, is allowed combined leave for ten months, *vis*, privilege leave for six months and furlough for the remaining period under Articles 260, 308 (b) and 233 of the Civil Service Regulations and Government of India, Finance Department, No. 168-C.S.R., dated the 24th February, 1919, with effect from the 20th May, 1920.

LIEUT.-COL. J. J. URWIN, I.M.S., Civil Surgeon of Saran, is appointed to act as Civil Surgeon of Gaya until further orders.

SUBJECT TO HIS MAJESTY'S approval, Colonel Charles Mactaggart, C.S.I., C.I.E., M.B., has been permitted by the Right Hon'ble the Secretary of State for India to retire from the service, with effect from the 29th March, 1920.

THE services of the undermentioned officers are placed permanently at the disposal of the Government of the United Provinces, with effect from the dates noted against their names—

1 Major W. H. Illius, F.R.C.S.E., 9th September, 1916

2 Major A. E. J. Lister, M.B., F.R.C.S., V.H.S., 10th October, 1917

3 Lieut.-Col. H. Ross, O.B.E., M.B., F.R.C.S.I., 30th October, 1917

4 Major V. B. Nesfield, F.R.C.S., 26th February, 1918

5 Major G. A. Jolly, M.B., F.R.C.S.E., 24th August, 1918

6 Major A. Cameron, M.B., 11th November, 1918

7 Major H. C. Buckley, M.D., F.R.C.S.E., 16th August, 1919

THE KING has been graciously pleased, on the occasion of His Majesty's Birthday, to signify His Majesty's intention of conferring the honour of Knighthood on the following—

COLONEL HORMASJEER EDULJEER BANATVALA, C.S.I., Indian Medical Service (retired), late Inspector-General, Civil Hospitals, Assam.

LIEUT COL EDMUND ALEXANDER WILLIAM HALL, MB, Bengal (supernumerary), is permitted subject to His Majesty's approval, to retire from the service, with effect from the 20th May, 1920

TEMP CAPT SAILENDRA NATH CHANDRA is permitted, subject to His Majesty's approval to resign his commission with effect from the 17th March, 1920

TEMP CAPT SURAPATI GHOSH is permitted subject to His Majesty's approval, to resign his commission, with effect from the 6th April, 1920

LIEUT COL. J N WALKER IMS, Civil Surgeon Benares privilege leave for one month

MAJOR I DUNBAR RAMC. Military Medical Officer at Benares to hold civil medical charge of the Benares District in addition to his military and other duties, *vice* Lieut Col Walker, IMS, on leave

IN pursuance of provisions of section 7 of the Bihar and Orissa Medical Act (Bihar and Orissa Act II of 1916) it is hereby notified that Major W Gillitt CIE MD IMS Officiating Inspector General of Prisons is nominated by the Local Government under section 4 (b) of the Act to be a member of the Bihar and Orissa Council of Medical Registration *vice* Lieut Col B J Singh CIL IMS, resigned

LIEUT COL. F H WATLING IMS, made over charge of the Buxar Central Jail to Major H R Dutton IMS, in the afternoon of the 12th April 1920

MAJOR H R DUTTON IMS, made over charge of the Buxar Central Jail to Mr A J Mainwaring ICS in the forenoon of the 3rd May 1920

MAJOR H R DUTTON IMS officiated as Superintendent of the Buxar Jail from the 13th April to the 2nd May, 1920

IN supersession of the Home Department notification No 375 dated the 26th April 1920 Lieut Col R P Wilson FRCS DPH IMS Professor of Surgery, Medical College Calcutta, and Surgeon to the College Hospitals is granted combined leave for eight months *ie* privilege leave for five months and seventeen days and furlough on average salary for the remaining period, with effect from the 24th March 1920

MAJOR F P MACNIE, OBE MD FRCP FRCS, IMS, is appointed to officiate as Professor of Pathology, Medical College, Calcutta with effect from the date on which he assumed charge of his duties until further orders

THE services of Captain W O Walker MB, IMS, are placed temporarily at the disposal of the Government of Bengal with effect from the 7th April 1920

MAJOR T J CAREY EVANS MC, Indian Medical Service, Staff Surgeon Bangalore is appointed to officiate as an Agency Surgeon and is posted as Residency Surgeon Mysore in addition to his own duties with effect from the 25th May, 1920 and until further orders

THE undermentioned are permitted subject to His Majesty's approval to retain the rank of Captain, on relinquishing their temporary commissions with effect from the dates specified—

Pascal John deSouza dated 6th August 1919
Kashibhai Vaghajbhai Amin dated 11th August, 1919
Hari Pada Mukerjee dated 27th November 1919
Aiyappa Padmanabha Pillay dated 1st January 1920
Venkatrao Manjunath Karkini MB dated 11th March 1920

TEMPORARY CAPTAIN THOMAS HENRY BISHOP is permitted, subject to His Majesty's approval to resign his commission, with effect from the 12th December, 1919

TEMPORARY CAPTAIN SHIRDAR CHINTAMAN JOG is permitted, subject to His Majesty's approval to resign his commission, with effect from the 10th June, 1920

TEMPORARY CAPTAIN MADAN MOHAN MAITRA is permitted, subject to His Majesty's approval to resign his commission, with effect from the 12th June, 1920

TEMPORARY CAPTAIN NARAIN RAMA RAO UDHAYA is permitted subject to His Majesty's approval, to resign his commission, with effect from the 14th June, 1920

THE KING has approved the promotion of the following officers of the Indian Army, Indian Medical Service Indian Army Departments Indian Army Reserve of Officers and Indian Defence Force—
Sachchidananda Hoshen Paul, MRCS, LRCP, DPH 21st October, 1919

THE KING has approved the grant of the temp rank of Lieut in the Indian Medical Service to the under-mentioned gentleman—

Sachchidananda Hoshen Paul, MRCS, LRCP, DPH 21st October, 1918

CAPTAIN A F BABOYAU, Indian Medical Service, is granted subject to His Majesty's approval, the temporary rank of Major while holding an appointment as Deputy Assistant Director of Medical Services, dated 8th May 1919

CAPTAIN W M LUPRON, Indian Medical Service is granted subject to His Majesty's approval, the temporary rank of Major while holding an appointment as Deputy Assistant Director of Medical Services dated 11th May 1919

CAPTAIN J B LAPSLEY, Indian Medical Service, is granted subject to His Majesty's approval the temporary rank of Major while holding an appointment as Deputy Assistant Director of Medical Services dated 16th May 1919

CAPTAIN J C BHARUCHA, Indian Medical Service, is granted subject to His Majesty's approval, the temporary rank of Major while holding an appointment as Deputy Assistant Director of Medical Services, dated 18th May 1919

IN accordance with paragraph 13 of the Regulations of the Bihar and Orissa Medical Examination Board the Lieutenant Governor in Council is pleased to appoint Lieutenant Colonel J G P Murray, MB CM, MD FRDC, IMS, Civil Surgeon Ranchi, to be a member of the said Board, *vice* Lieutenant-Colonel J C S Vaughan IMS, resigned

CIVIL SURGEON LIEUT-COL. S ANDERSON, IMS, made over charge of the Purnea Jail to Civil Assistant Surgeon Akshay Kumar Mukherji in the afternoon of the 19th May 1920

LIEUTENANT-COLONEL J N WALKER IMS Civil Surgeon Benares, to hold administrative and medical charge of the District Jail and medical charge of the Central Jail, Benares up to the 6th June, 1920 in addition to his other duties *vice* Major N S Harvey IMD granted leave.

CAPTAIN P R VAKIL IMS, military medical officer to hold civil medical charge of Roorkee in addition to his own duties, *vice* Captain J S S Martin, IMS

CIVIL SURGEON MAJOR H G C MILLS made over charge of the Muthari Jail to Civil Assistant Surgeon Rai Tripura Charan Guha Bahadur in the afternoon of the 10th June, 1920

THE KING has approved the retirement of the following Officers —

INDIAN MEDICAL SERVICE

Col H Fooks, dated 19th April, 1920

Maj F N White, CIE, MD, dated 20th February, 1920

THE undermentioned appointments are made —

Assistant Director of Medical Services

Lieut A Hooton, Indian Medical Service, dated 18th March, 1919

TEMPORARY CAPTAIN NARAYAN LAKSHMAN SHEOREY is permitted subject to His Majesty's approval, to resign his commission, with effect from the 24th May, 1920

CAPTAIN PERCIVAL SANDYS CONNELLAN is permitted, subject to His Majesty's approval, to resign his commission, with effect from the 10th June, 1920

DR VINAYAK MAHADEO PHATAK is permitted, subject to His Majesty's approval, to retain the rank of Captain on relinquishing his temporary commission in the Indian Medical Service, with effect from the 1st December, 1918

THE following acting promotions are notified, subject to His Majesty's approval —

Temporary Captain W M Will, Indian Medical Service, to be acting Major while Registrar of an Indian General Hospital, dated 1st February, 1920

Temporary Captain E C Brooks, Indian Medical Service to be acting Major while Registrar of an Indian General Hospital dated 17th February, 1920

Captain J P Huban, Indian Medical Service, to be acting Lieutenant-Colonel while commanding an Indian Field Ambulance Dated 17th June, 1919

Major H B Scott, Indian Medical Service, to be acting Lieutenant-Colonel while commanding an Indian Field Ambulance From 16th November, 1919, to 4th December, 1919

Major W S McGilivray, MD, to be acting Lieutenant-Colonel while commanding an Indian General Hospital Dated 13th April, 1920

Captain G L Duncan to be acting Lieutenant-Colonel while commanding an Indian General Hospital Dated 23rd April, 1920

Captain P B Bharucha, DSO, FRCS, Indian Medical Service to be acting Major while Registrar of an Indian General Hospital Dated 1st March, 1920

Temporary Captain B B Shah, Indian Medical Service, to be acting Major while Registrar of an Indian General Hospital Dated 3rd December, 1919

Major G Holroyd MB, Indian Medical Service to be acting Lieutenant-Colonel while commanding an Indian General Hospital Dated 1st April, 1920

Major W E Brierly MB, FRCS, Indian Medical Service, to be acting Lieutenant-Colonel while commanding an Indian General Hospital Dated 1st April, 1920

Captain N B Morris, Indian Medical Service, to be acting Lieutenant-Colonel while commanding a Combined Field Ambulance From 13th October, 1919, to 30th October, 1919

Major M Ba-Ket MB Indian Medical Service, to be acting Lieutenant-Colonel while commanding a Combined Field Ambulance Dated 2nd April, 1920

MAJOR H H THOBURN, CIE, Indian Medical Service, is posted as Residency Surgeon and Chief Medical Officer in Baluchistan, with effect from the 1st May, 1920

MAJOR D HERON, CIE Indian Medical Service, Medical Officer, His Britannic Majesty's Consulate for Sistan and Kam, and *ex-officio* Vice-Consul Sistan, officiated as His Britannic Majesty's Consul for Sistan and Kam, in addition to his own duties for the period from the 13th April, 1920, to 31st May, 1920

MAJOR F A BARKER, MB, OBE, IMS, is appointed to be Superintendent of the Cellular and Female Jails, Port Blair, sub *pro tem*, with effect from the 11th May, 1920, until further orders

LIEUTENANT-COLONEL G McI C SMITH, CMG, Indian Medical Service, is appointed to officiate as an Agency Surgeon, and is posted as Residency Surgeon in Kashmir, with effect from the 22nd May, 1920, and until further orders

MAJOR I D JONES, MD (Lond), IMS, on reversion from military duty, was placed on general duty at the Sassoon Hospital, Poona, from the forenoon of 30th March to the afternoon of the 9th April, 1920

HIS EXCELLENCY THE GOVERNOR in Council is pleased to make the following appointments, *vice* Lieutenant-Colonel E C G Maddock, IMS, transferred, pending further orders —

Assistant Surgeon Phiroshah Pestanj Balsara, LM & S, to do duty as Civil Surgeon, Sholapur

Major S S Vazifdar, IMS, to do duty as Civil Surgeon, Ahmednagar, in addition to his military duties

LIEUTENANT-COLONEL W GLEN LISTON, CIE, MD DPH IMS, Director, Bombay Bacteriological Laboratory, was placed on deputation in England from 9th September, 1919, to 8th December, 1919, in continuation of the leave granted to him in Government Notification No 2002, dated the 8th March, 1919, and was on furlough from 9th December, to 30th December, 1919 both days inclusive

NOTE.—In the notification in the *London Gazette*, dated 14th Nov, 1919, regarding the relinquishment of his temporary rank in the IMS, by Captain L S Machado, FRCSI for "10th Oct, 1919," read "28th Sept, 1919"

THE KING has approved the grant of temporary rank in the Indian Medical Service (as shown below) to the undermentioned gentlemen —

To be temp Captains

Adalbert Henry Ernst 14th Mar, 1920

Joseph Lockhart Downes Yule, MB, CHB 8th April, 1920

To be temp Lieutenants

8th April, 1920

James Henry Barrett

Archibald Stewart Miller, MB CHB

Leslie Lyne, MRCS, LACP

Aiden Joseph O'Sullivan

SUBJECT to His Majesty's approval, Lieutenant-Colonel John Joseph Bourke, CIE, MB, has been permitted by the Right Hon'ble the Secretary of State for India to retire from the service, with effect from the 1st April, 1920

Serbian Order of St Sava, 4th Class

MAJOR CUTHBERT LINDSAY DUNN, Indian Medical Service

THE services of Lieutenant-Colonel R. McCarrison IMS, who was employed on special duty under the Indian Research Fund Association were re-placed at the disposal of the Foreign and Political Department, with effect from the 29th January, 1920

TEMPORARY CAPTAIN JATINDRA MOHAN MUKHARJI is permitted, subject to His Majesty's approval, to resign his commission, with effect from the 3rd May, 1920

TEMPORARY CAPTAIN KALI PRASAD BAGCHI is permitted subject to His Majesty's approval, to resign his commission, with effect from the 19th May, 1920

TEMPORARY CAPTAIN EDWARD CLAUDE BROOKS is permitted, subject to His Majesty's approval, to resign his commission, with effect from the 20th May, 1920

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WHAT is at the root of the Infant Mortality problem? In many cases the lack of proper nourishment. The Mother is improperly nourished both before and after the birth of her child, consequently the infant suffers, and only too often dies. This in many cases is not due to the lack of food, but to the absence from the diet of some essential factor.

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MAJOR E J C McDONALD, IMS Officiating Civil Surgeon Subsagar is granted privilege leave for four months under Article 260 of the Civil Service Regulations and Government of India Finance Department letter No 168CSR dated the 24th February, 1919, with effect from the 1st July 1920

LIEUTENANT COLONEL A BUCHANAN, MA MD MCir MAO IMS, Civil Surgeon Pachmarhi, is reposted to Nagpur

THE Chief Commissioner is pleased to appoint Lieutenant Colonel A Buchanan MA, MD MCir, MAO IMS Civil Surgeon Nagpur to be Superintendent of the Lunatic Asylum Nagpur

THE Chief Commissioner is pleased to appoint Lieutenant Colonel A Buchanan MA MD MCir, MAO IMS Civil Surgeon Nagpur to be Superintendent of the Robertson Medical School Nagpur

LIEUTENANT COLONEL J W WATSON CIE Indian Medical Service is granted privilege leave for six months combined with commuted furlough on full average salary for two months with effect from the 23rd March 1920

SUBJECT to His Majesty's approval the services of temporary Lieutenant Lolit Mohan Sen are dispensed with on account of medical unfitness with effect from the 9th June 1920

UNDER the provisions of section 5 (1) (a) of the Punjab Medical Registration Act II of 1916 the Lieutenant Governor is pleased to nominate Colonel R C MacWatt CIE MB FRCS IMS Inspector General of Civil Hospitals Punjab to be the President of the Punjab Medical Council with effect from 30th June 1920 *vide* Lieutenant Colonel D M Davidson MD IMS resigned

IN exercise of the powers conferred on him by section 6 (2) (c) of the Indian Universities Act 1904 the Chancellor of the Punjab University is pleased to nominate Major H H Broome IMS Professor Medical College Lahore, to be Ordinary Fellow of the said University

IN the Home Department notification No 411 dated the 4th May 1920 regarding the grant of combined leave to Colonel G J H Bell CIE MB, IMS Inspector-General of Civil Hospitals Bihar and Orissa *after* the words 'privilege leave for four months read "and ten days

THE following acting promotion is notified subject to His Majesty's approval —

Captain W P Hogg DSO MC Indian Medical Service to be acting Lieutenant Colonel while commanding a combined Casualty Clearing Station Dated 24th June, 1920

Major V N Whitmore Indian Medical Service to be acting Lieutenant-Colonel while commanding No 17 Casualty Clearing Station Hospital Waziristan Force From 13th June 1917 to 30th September 1917

THE services of Major T C Boyd IMS are placed temporarily at the disposal of the Chief Commissioner Delhi for employment as Assistant Health Officer Notified Area Delhi

INDIAN MEDICAL SERVICE.

TEMPORARY Captain J M Guilfoyle is permitted subject to His Majesty's approval, to resign his commission with effect from the 4th February, 1920

THE undermentioned are permitted subject to His Majesty's approval to resign their commissions with effect from the dates specified —

Temporary Captain Satish Chandra Sen Gupta Dated 1st June 1920

Temporary Captain Cowas Cursetji Mehta Dated 4th July 1920

Temporary Captain Madhava Krishna Pillai Dated 4th July 1920

LIEUTENANT-COLONEL H M MACKENZIE, IMS, Professor of Pathology King Edward Medical College Lahore assumed charge of the office of Professor of Physiology King Edward Medical College Lahore in addition to his own duties, on the afternoon of 30th May, 1920, relieving Doctor C C Calkb, MB, who proceeded on leave from the same date

THE following promotions are made, subject to His Majesty's approval with effect from the 29th July 1920 —

Majors to be Lieutenant Colonels

Charles William Francis Melville MB FRCS E Robert McCarrison, MD FRCP VHS (Brevet Lieutenant Colonel)

James Masson MB FRCS E

William Maurice Anderson, CIE, MD

William Hugh Leonard, FRCS, (Brevet Lieutenant-Colonel)

Andrew Watson Cook Young, MB (Brevet Lieutenant Colonel)

James Graham Goodenough Swan CIE MB

Robert McLauchlan Dalziel MB FRCS E

Shah Abdur Razzak

Robert Basil Boothby Foster MB (acting Lieutenant-Colonel)

THE KING has approved the grant of the temporary rank of Lieutenant in the Indian Medical Service to the following gentleman —

WALTER HUGH CRITCHEY MB CHB (Edin), 23rd May 1920

THE Lieutenant Governor of the Punjab is pleased to accept the resignation by the Honble Lieutenant Colonel D M Davidson IMS of his office of member of the Legislative Council of the Lieutenant Governor of the Punjab

FOR the purposes of section 73 (3) of the Government of India Act 1915 (5 and 6 Geo 5 chapter 61) and in pursuance of the provision of Regulation XI (a) of the Regulations for the nomination and election of members of the Legislative Council of the Lieutenant Governor of the Punjab and with the previous sanction of His Excellency the Viceroy and Governor General the Lieutenant-Governor is pleased to nominate Colonel Robert Charles MacWatt CIE MB FRCS IMS to be a member of the Council if the Lieutenant Governor of the Punjab for the purposes of making Laws and Regulations

MAJOR W S I SHAW MD IMS was granted by His Majesty's Secretary of State for India furlough on average salary from 14th September 1919 to 24th January 1920

HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to appoint Major J B Christian IMS on return from leave to do duty as Resident Surgeon St Georges Hospital Bombay and thereafter on the opening of the Matheran season in October 1920 to act as Superintendent of Matheran *vide* Lieutenant Colonel H A F Knapton IMS on furlough pending further orders

HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to make the following appointment pending further orders —

Major K G Gharpurey IMS on return from leave, to be substantive *pro tem* Civil Surgeon Dhulia

MAJOR R B LLOYD MB IMS officiating Chemical Examiner Bengal and Professor of Chemistry Medical College Calcutta, is appointed to be Imperial Serologist with effect from the date on which he assumed charge

of his duties. He will continue to hold, in addition, his present officiating appointment until further orders.

IN supersession of the Home Department Notification No 295, dated the 24th March, 1920, Major and Brevet Lieutenant-Colonel F A F Barnardo, CBE, CIE, MB, FRCS E, IMS, is appointed to be Civil Surgeon, Simla (East), with effect from the afternoon of the 15th March, 1920.

BREVET LIEUTENANT-COLONEL R McCARRISON, Indian Medical Service, was granted privilege leave for six months, combined with furlough for six months, under Articles 233 and 308 (b) of the Civil Service Regulations with effect from the 29th January, 1920.

MAJOR A N DICKSON, MC, Indian Medical Service, is posted as Civil Surgeon Peshawar, with effect from the 9th July, 1920.

THE following promotions are made, subject to His Majesty's approval —

Captains to be Majors

Ram Nath Chopra, MB dated 1st August, 1920, Hugh Stott, OBE, MB, dated 1st August, 1920, Abdus Sattar Khan, dated 1st August, 1920, Manek Dhunjishaw Wadia, dated 1st August, 1920, Taylor David Murison, dated 1st August, 1920, Arthur Jessop Symes, dated 1st August, 1920.

Temporary Honorary Captain Dhanjibhoy Pestonji Sethna, MD, LMRC P, is granted, subject to His Majesty's approval the temporary honorary rank of Major, with effect from the 19th July, 1920, and until his employment in an honorary capacity in Bombay terminates.

Captain John McDougall Eckstein is permitted, subject to His Majesty's approval, to resign his commission, with effect from the 15th July, 1920.

Temporary Captain Pertanji Manekji Masina is permitted, subject to His Majesty's approval, to resign his commission, with effect from the 17th July, 1920.

The promotion to his present rank of Major Robert Siggins Kennedy, DSO MC MB, is antedated from the 1st February, 1918, to the 1st August, 1917.

LIEUTENANT-COLONEL E C MacLEOD, IMS, Civil Surgeon, Lakhimpur, and Superintendent Berry-White Medical School, Dibrugarh is allowed, under Article 260 of the Civil Service Regulations, privilege leave for one month, with effect from the 1st August, 1920, or any subsequent date on which he may avail himself of it.

THE following acting promotion is notified, subject to His Majesty's approval —

Major H W Illus, FRCS E, Indian Medical Service, to be acting Lieutenant-Colonel, while holding an appointment as Officer Commanding a Combined Casualty Clearing Station. Dated the 4th June, 1920.

Lieutenant-Colonel L T, R Hutchinson MD, BC, DPh (Cantab), IMS, has been allowed by His Majesty's Secretary of State for India an extension of furlough by one week.

HIS EXCELLENCY THE GOVERNOR IN COUNCIL has been pleased to make the following appointments *vice* Dr J C Young, MB resigned —

Major M S Iran, IMS, to act as Civil Surgeon, Aden, in addition to his other duties.

Major J W Barnett, IMS, to act as Superintendent, Aden Special Prison, in addition to his other duties.

THE undermentioned officer has been granted by His Majesty's Secretary of State for India extension of leave —

Name	Service	Appointment	Period and nature of leave
Lt Col T Hunter	IMS	Civil Surgeon, UP	Two months' commuted furlough

THE KING has approved the retirement of the following officer—

Major-Genl H Hendley, MD, KHS 26th June, 1920.

MAJOR A E J LISTER, MB, FRCS, VHS, IMS, appointed to be Professor of Ophthalmology at King George's Medical College, Lucknow, with effect from the date on which he assumes charge of his duties.

Lieutenant-Colonel H Ainsworth MB, FRCS, IMS, Professor of Ophthalmology, King Edward Medical College, Lahore, is granted, with effect from the afternoon of the 14th April, 1920, combined leave for one year, *viz*, privilege leave for 3 months and 8 days, furlough on average salary for four months and 22 days, and furlough on half average salary for the remaining period.

Major W W Jendwine, CMG, MD, IMS is appointed to officiate as Professor of Ophthalmology, King Edward Medical College, Lahore, during the absence on leave of Lieutenant-Colonel H Ainsworth, MB, FRCS, IMS.

SUBJECT to His Majesty's approval, Kombur Ramaswamy Krishnaswami Iyengar, MB, Ch B (Edin), DPh (Lond), is appointed permanently to the Indian Medical Service as a Lieutenant. His commission will bear date 4th July, 1920.

Subject to His Majesty's approval, Dr John Laurence Rebello, MB, to be a temporary Lieutenant, with effect from the 27th July, 1920.

The following promotion is made, subject to His Majesty's approval —

Lieutenant to be Captain

Kombur Ramaswamy Krishnaswami Iyengar, MB, Ch B (Edin) DPh (Lond) Dated 5th July, 1920.

Vinayak Balvant Gokhale is permitted, subject to His Majesty's approval, to retain his rank of Captain on relinquishing his temporary commission, with effect from the 14th January, 1919.

Lieutenant-Colonel H B Melville, Indian Medical Service, an officiating Agency Surgeon, is granted privilege leave for three months and twenty-five days, combined with commuted furlough on full average salary for four months and six days, and ordinary furlough for four months, under Articles 233 and 308 (b), Civil Service Regulations, with effect from the 22nd May, 1920.

LIEUTENANT-COLONEL D M DAVIDSON, IMS, on being relieved of the office of Inspector-General of Civil Hospitals, Punjab, resumed charge of the office of Civil Surgeon, Lahore, with effect from the afternoon of the 3rd July, 1920, *vice* Major J G G Swan, CIE, IMS, proceeded on leave.

THE following officer has been granted leave —

Lieutenant-Colonel C A Gill, IMS, Chief Malaria Medical Officer, Punjab, 8 months, from 21st July, 1920 (afternoon).

Notice.

SCIENTIFIC Articles and Notes of interest to the profession in India are solicited. Contributors of Original Articles will receive 25 Reprints gratis, if required.

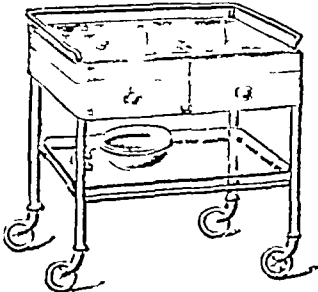
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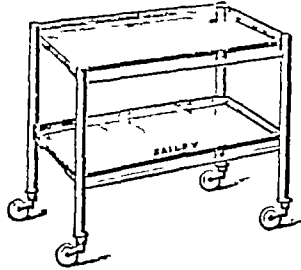
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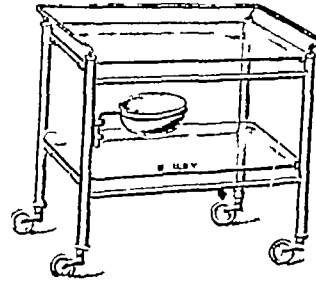
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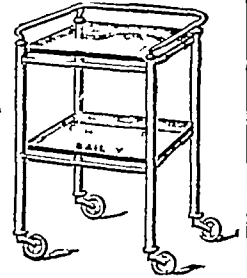
H 3084
Ward or Theatre Table
With 2 drawers and Swing Bowl
30 x 19 x 31



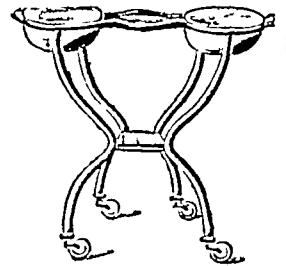
H 2999 'O G'
Theatre or Ward Table
3 Plate Glass Shelves, Bust
1 R Tyred Castors
26 x 10 x 31 20 x 19 x 34



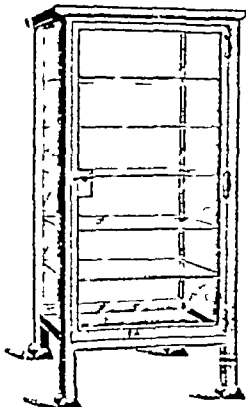
H 3052
Theatre or Ward Table
With Rail round Top and
Swing Bowl
30 x 18 x 31



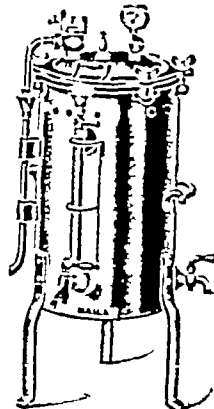
H 3038
Anaesthetist's Table
18 x 18 x 31



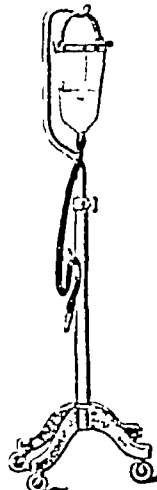
H 3751
Ward Washstand



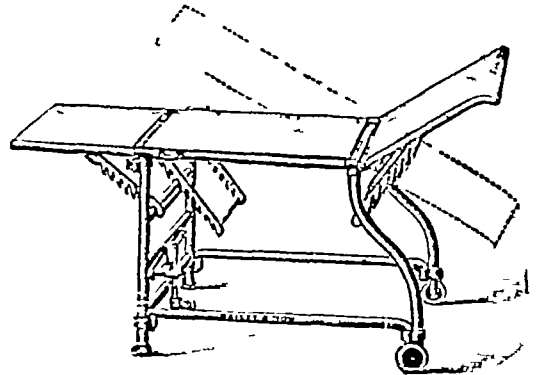
H 303
Aseptic Instrument
Cabinet
4 ft 4 in x 2 ft 2 in



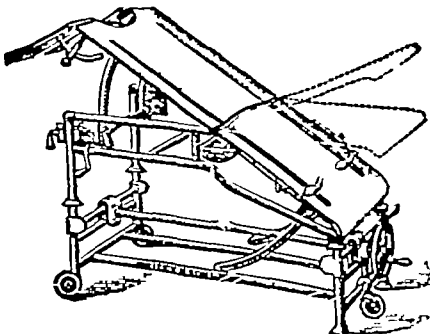
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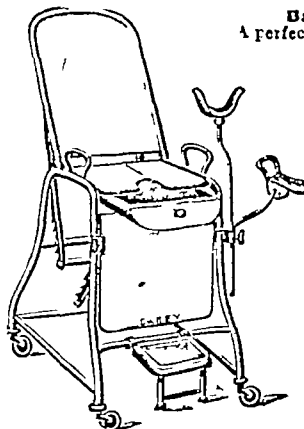
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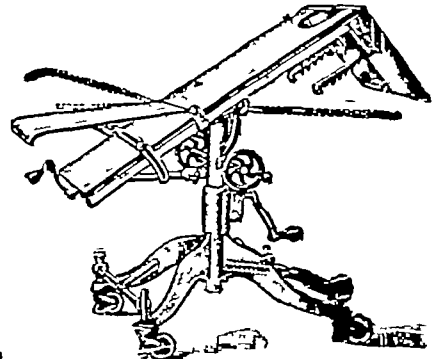
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Academy of Sciences, Paris, 14th Dec., 1908

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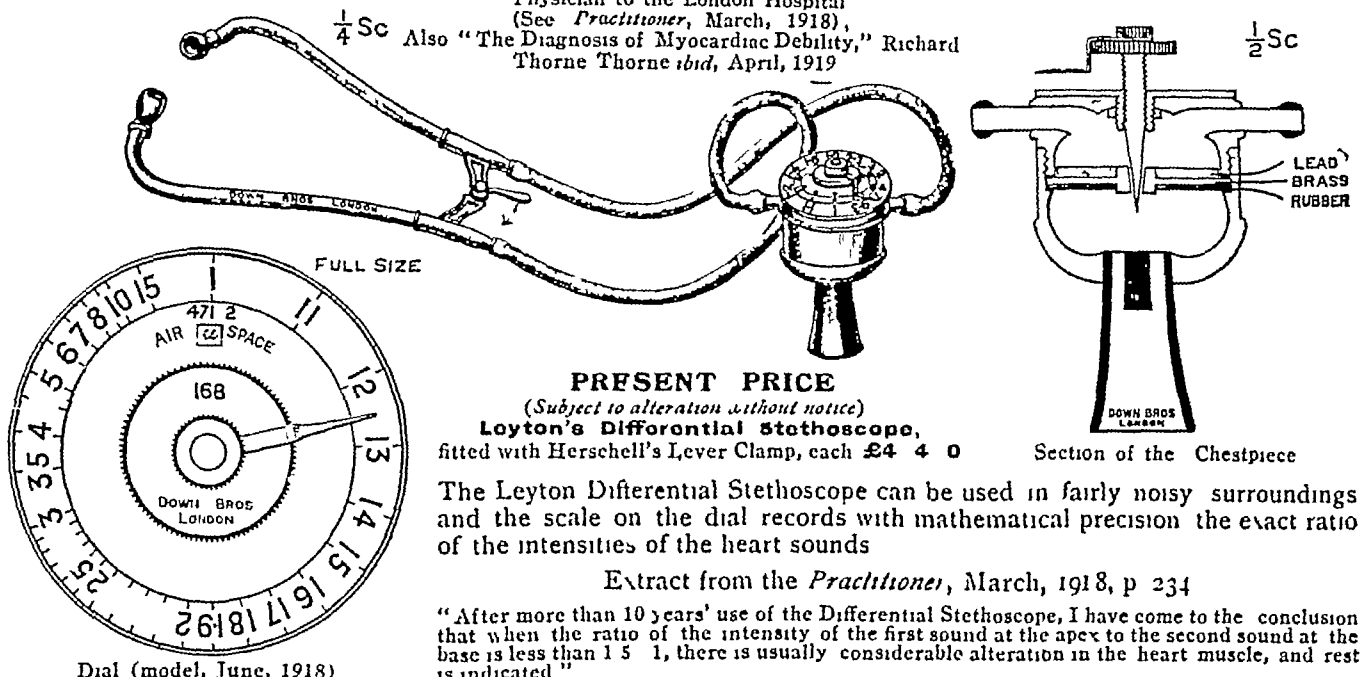
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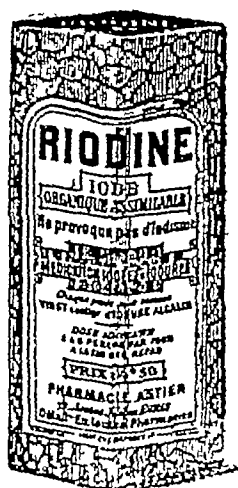
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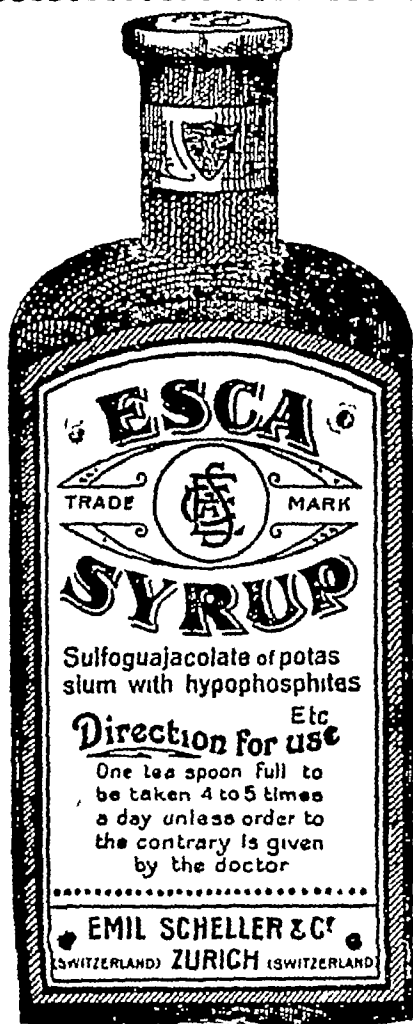
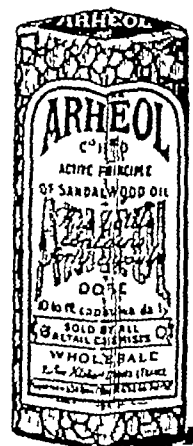
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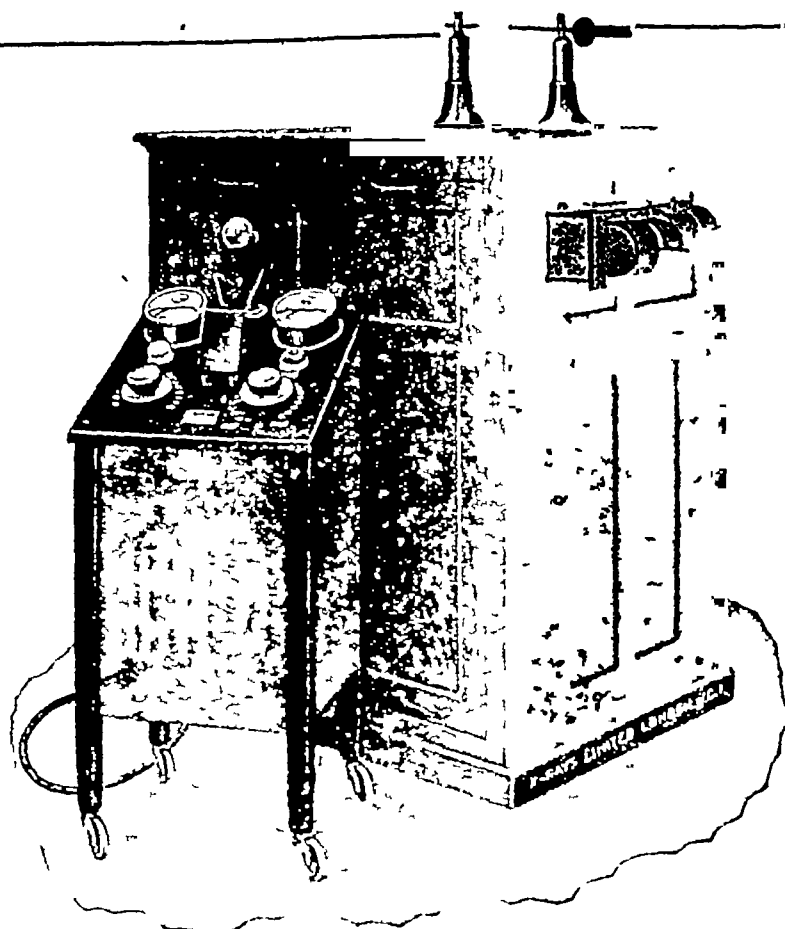
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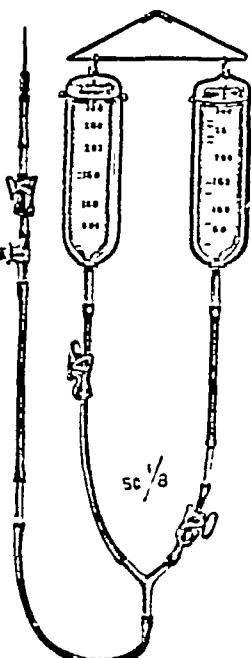
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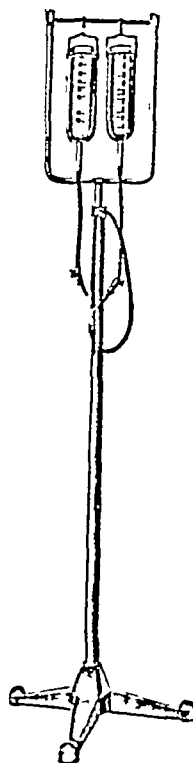
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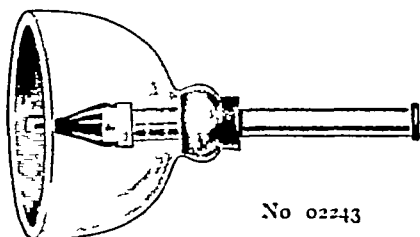


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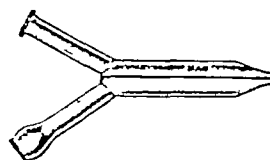
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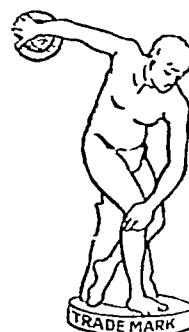
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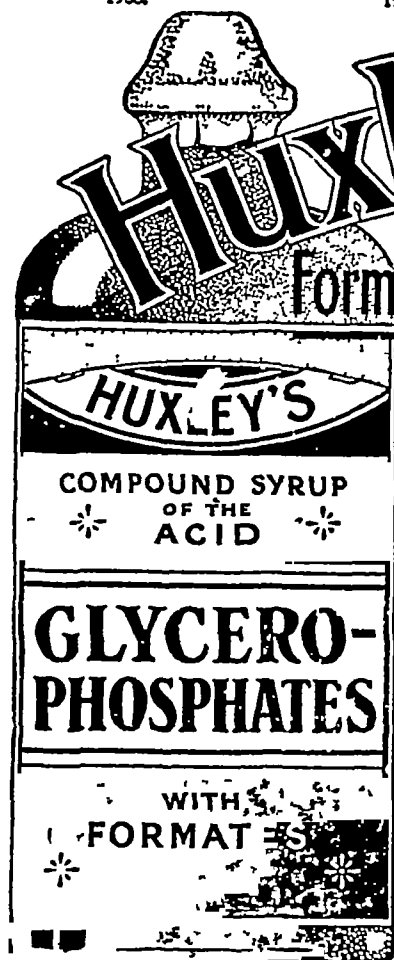


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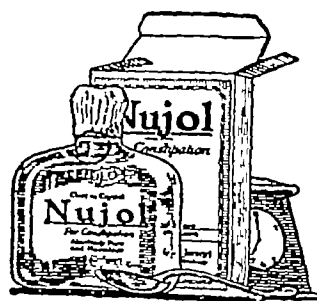
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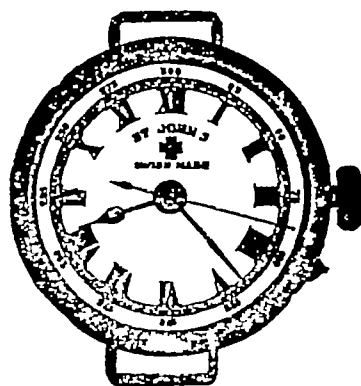
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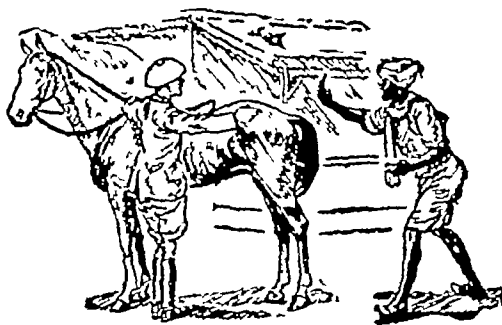
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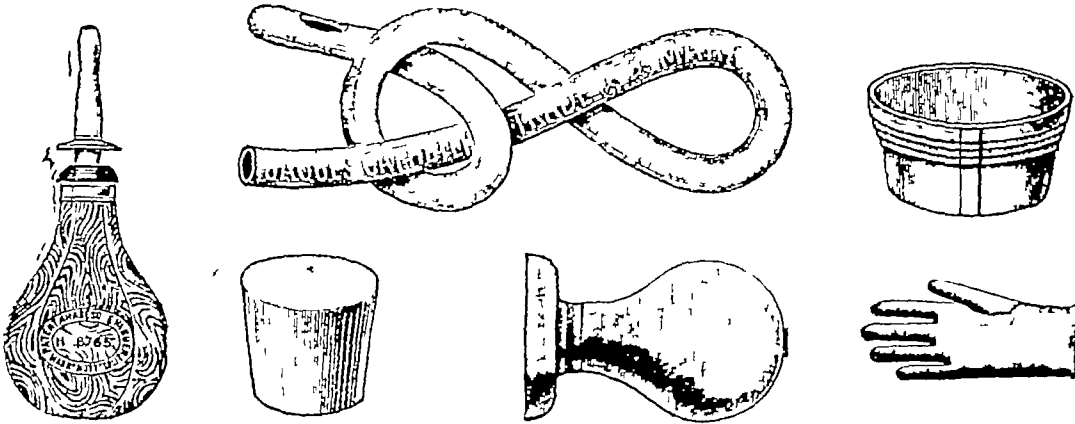
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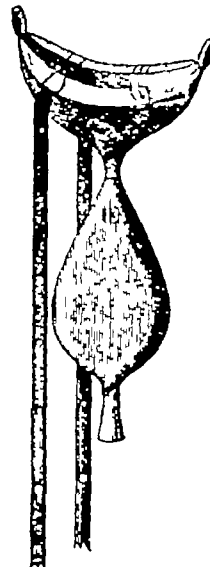
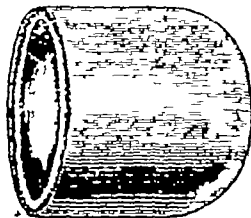


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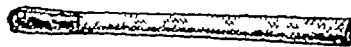
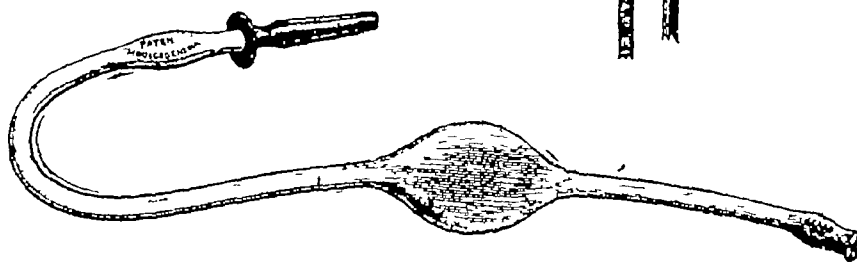
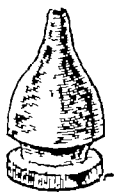
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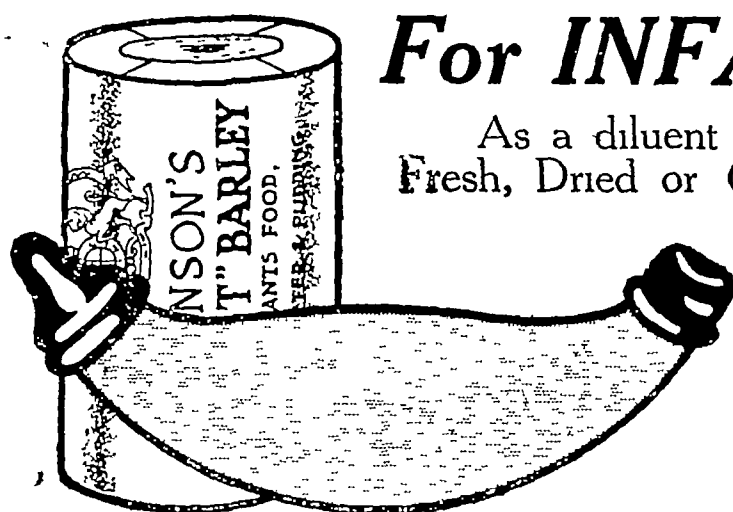
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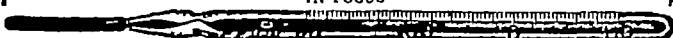
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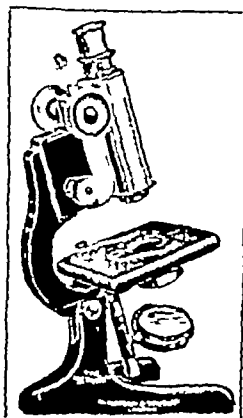
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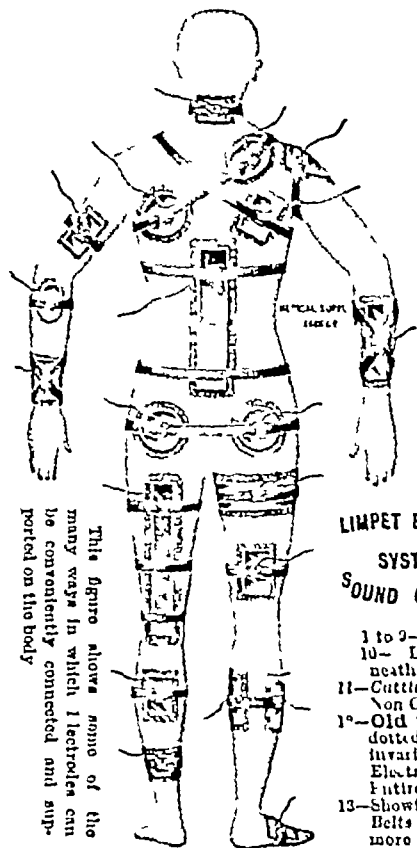
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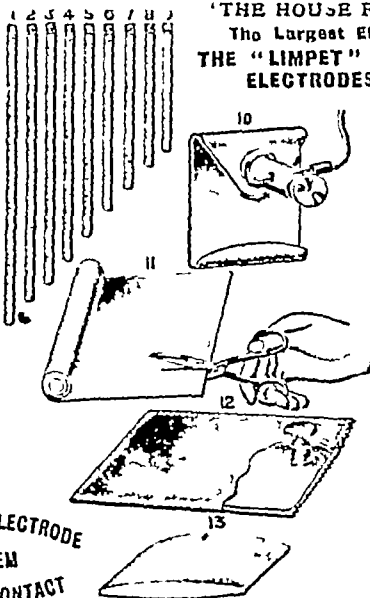
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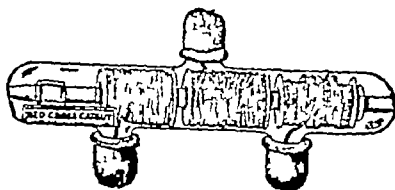
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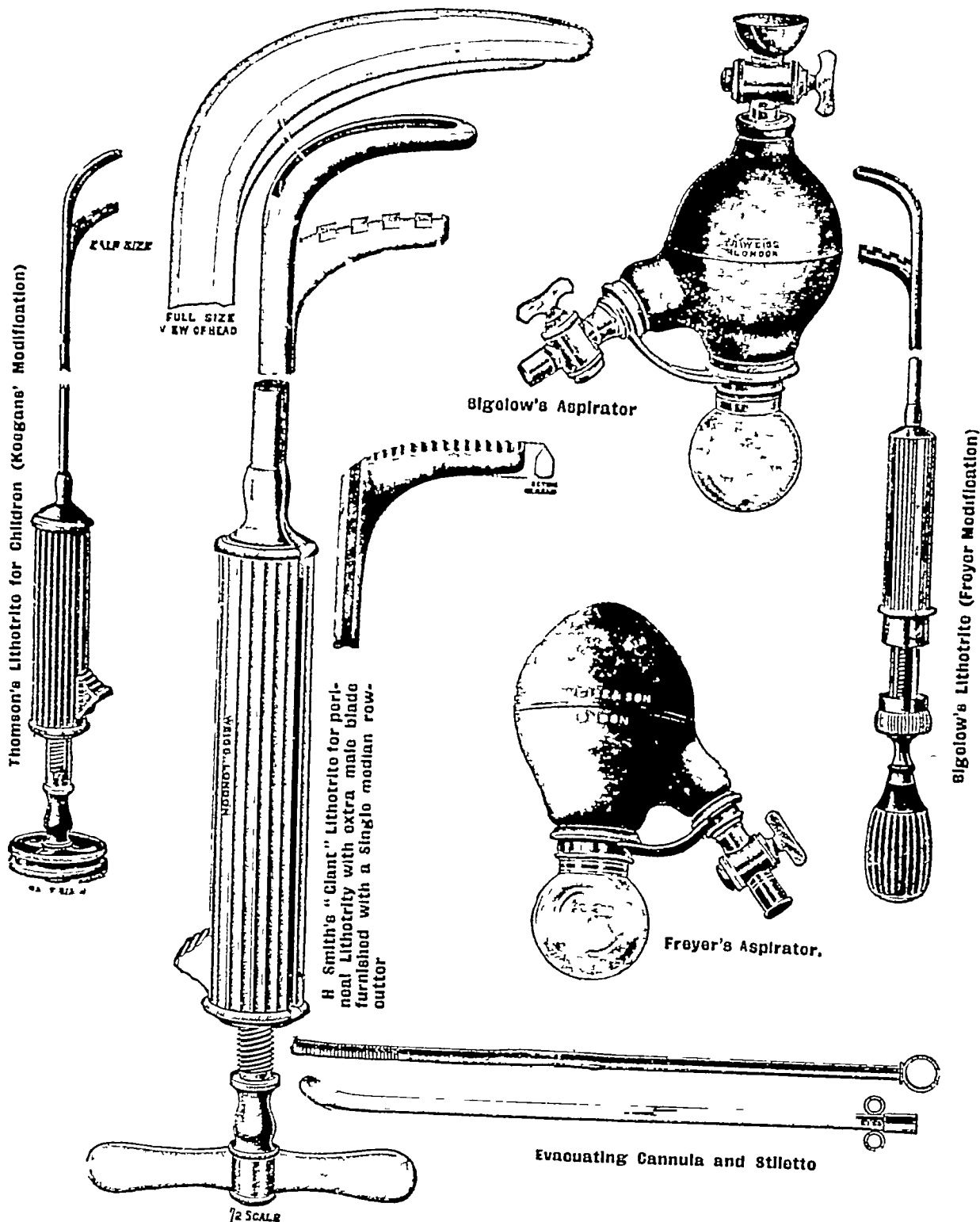
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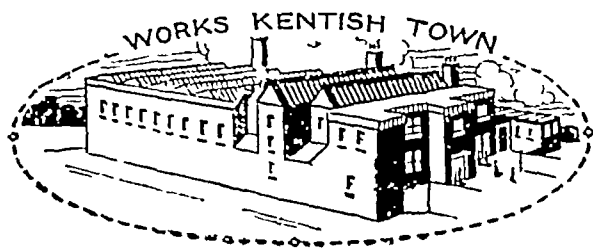
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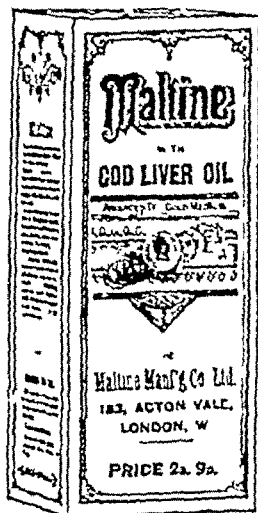
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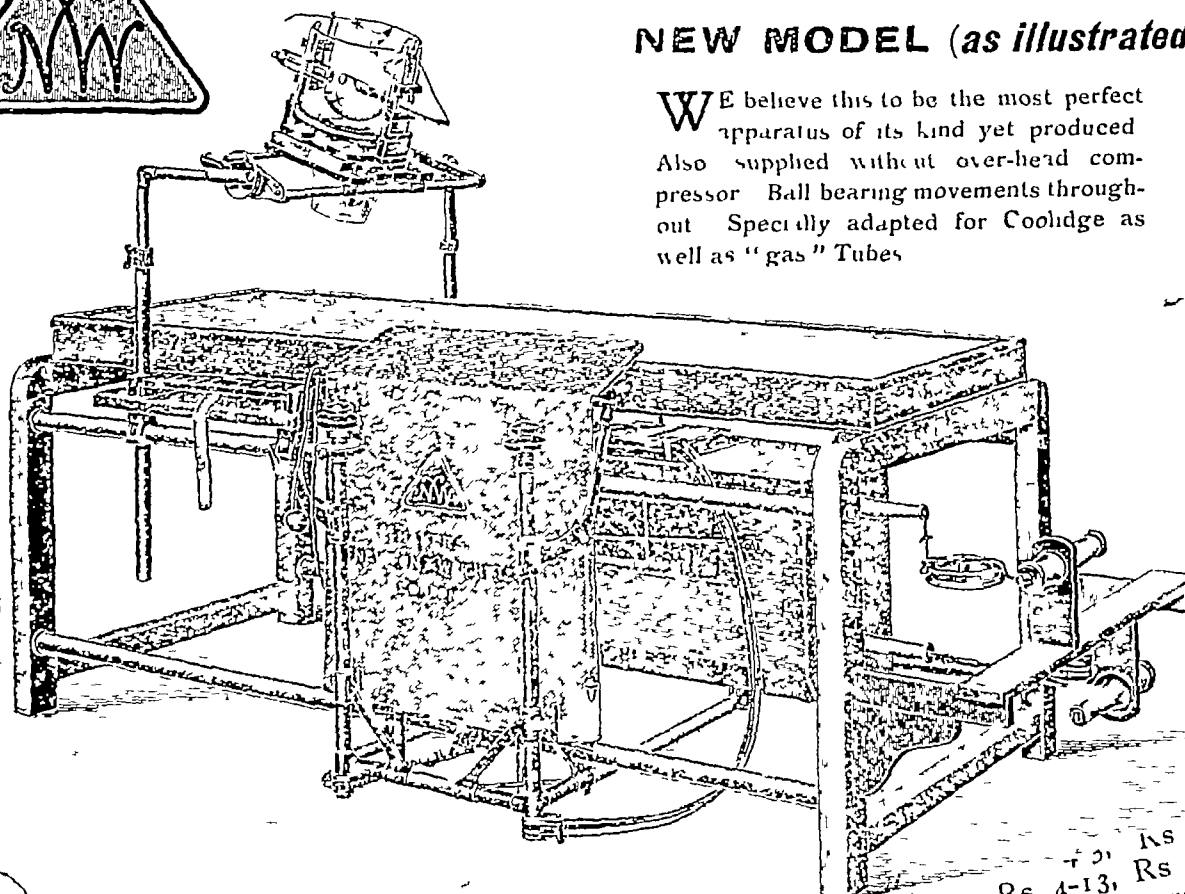
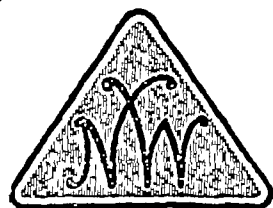
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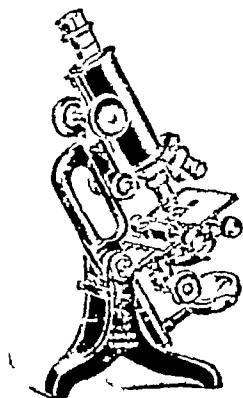
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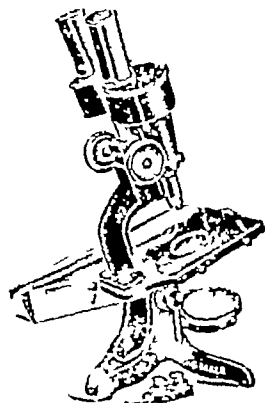
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Cream of Tartar — 98% still commands 145/ per cwt.

Cresylic acid is dearer 95% at 1/6 and 97% at 1/9.

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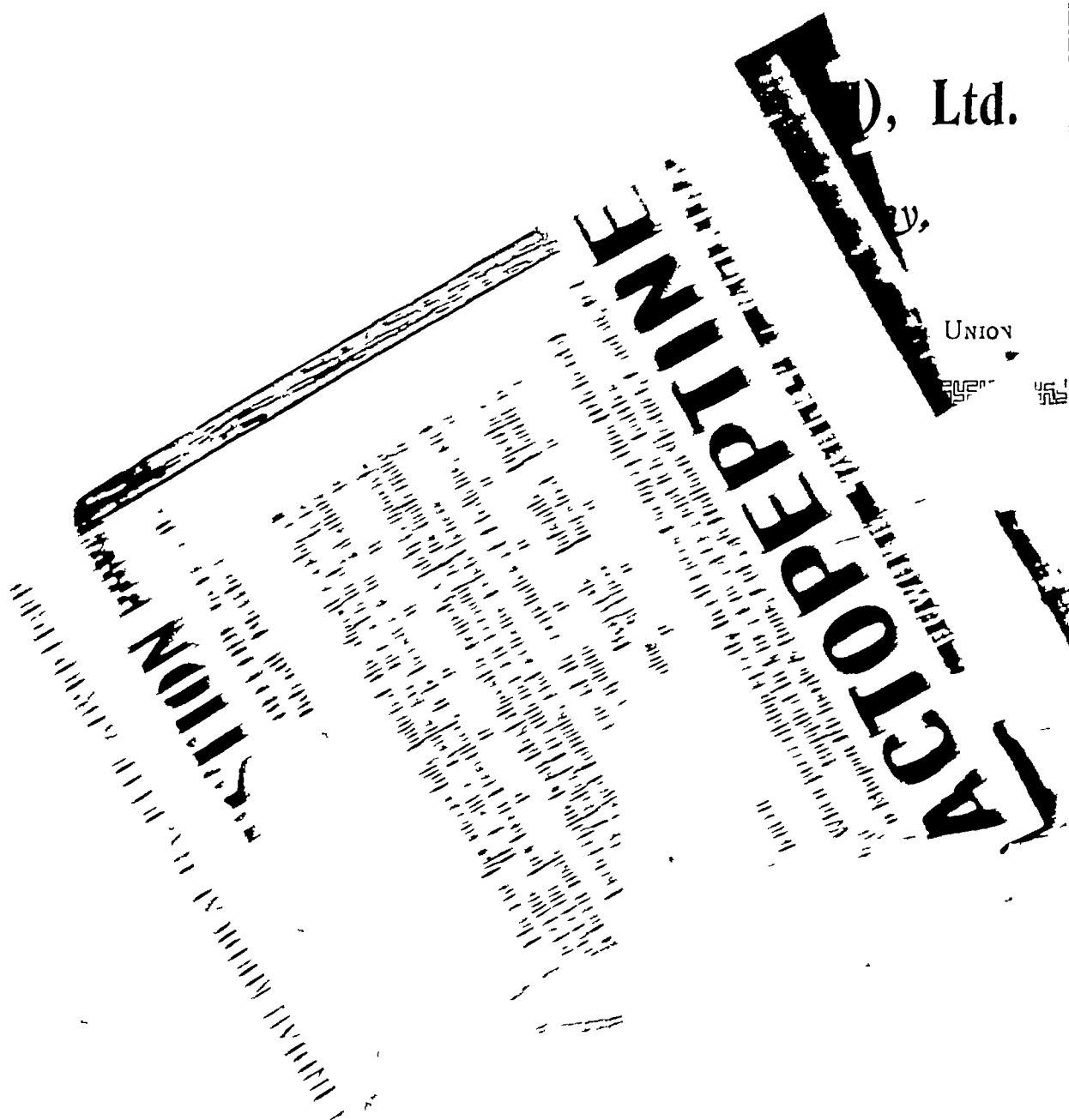
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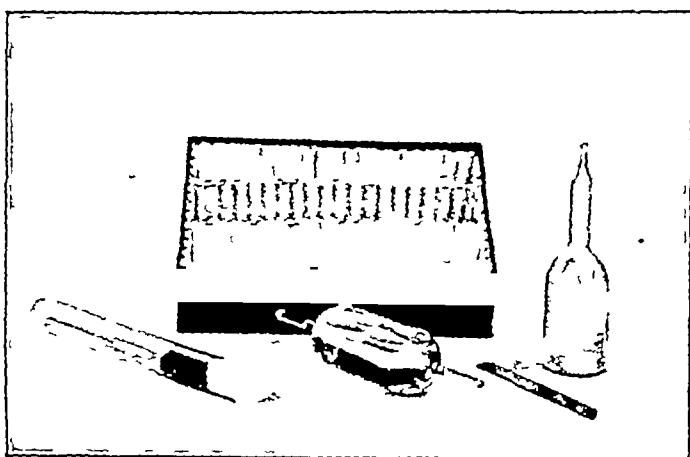


Fig 1

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From—Officer i/c Supplies
To—Officer Commanding

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The meat remained in the open air seventy hours before it became fly blown and it is doubtful in my mind if there would have been fly blows at that time, had it not rained the previous night The rain, no doubt, washed off the solution, but even at that, though the fly blows were in a tissue pocket, and the meat had become dark in colour, externally only, due to having been seared from the sun's heat, when cut open was very fresh in both colour and smell, and was quite edible

If the present intention to issue freshly killed beef is to be put in operation, this solution will be invaluable to me. I have had no occasion to use the solution on frozen meat only having used the preparation as a straight disinfectant in the butchery where I find it certainly purifies the air, and takes away any odour there may be

I find it very good for removing the odour arising when mutton has been hanging any length of time.

To—Major , London

Personal

Remarks by the Supply Officer above in connection with the test made of Milton at the Supply Depot of this Station are forwarded please I might mention what I saw of one or two demonstrations made by Mr Smith, it could be used to a very great advantage for many purposes, both in the Supplies and the Transport Sections of the C. A. S. C. It is by far the best disinfectant I have as yet seen and in view of the fact that fresh meat issues are about to be made, the butcher's shop is going to be not very far short of a slaughter house, and as a disinfectant and fly exterminator for this particular purpose I would strongly recommend the purchase of Milton in this connection

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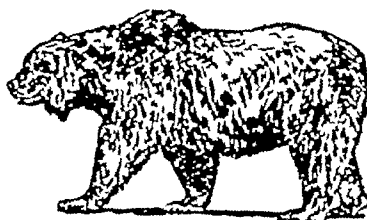
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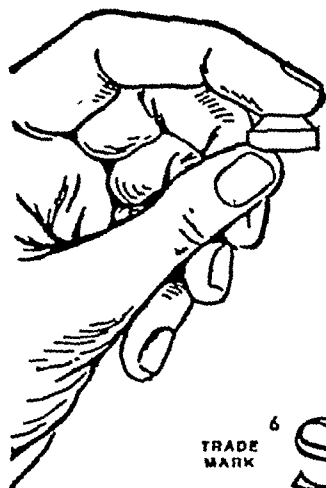
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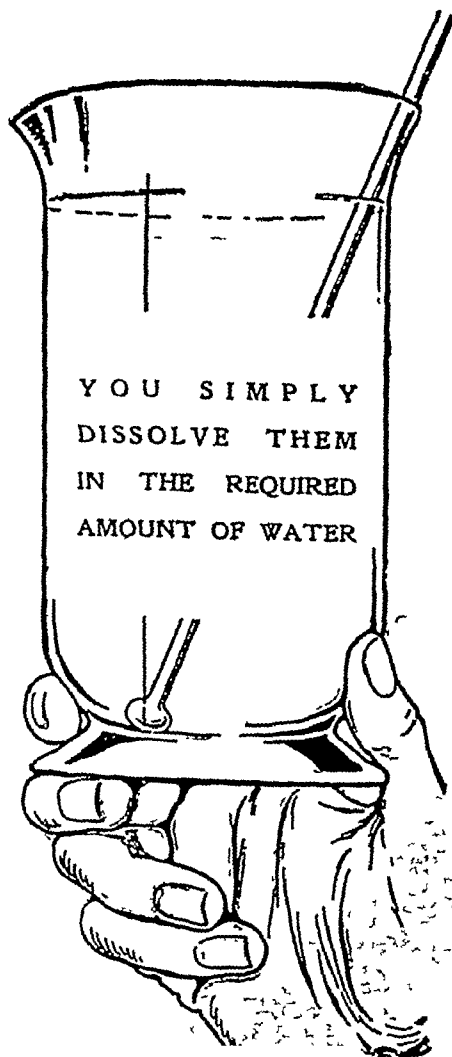
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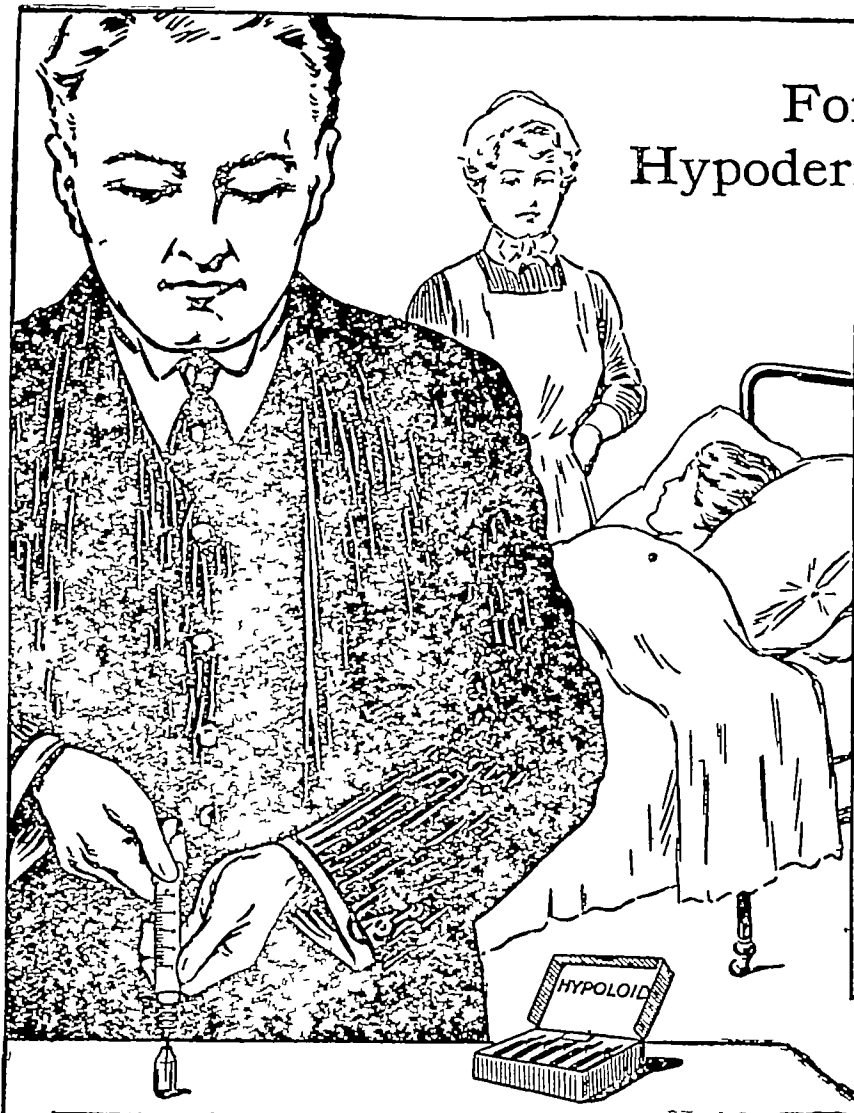


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Original Articles.

THE SUPERFLUOUS WOMAN

By H. F. STEPHENS,
CAPTAIN, R.A.M.C.

WHOEVER will consider the matter will realise that the problem of the superfluous woman in Europe grows more important every day. When it is considered as some Danish students recently have estimated, that as a result of the late war, there are in Europe to-day 15,000,000 more women than men, the problem becomes a serious one. In England alone between the ages of 15 and 45, there are at present according to the Registrar-General, well over five million single women, and for one reason or another he estimates that it is likely not more than one-half of these will ever marry. Frequently, too, in France and similar countries the grave question of depopulation has become the subject of considerable anxious discussion in the pages of their patriotic press. In the *Paris Medical* for example in its issue for March 20th and, again in that for April 17th Dr Paul Carnot states that the recent loss of potential husbands and fathers will result in the sterility of two million women in France and supposing that each of these women might have borne three children, he calculates that his country will lose six million citizens in this generation. This would be a serious shortcoming. "No convention moral or social," he writes "seems to us sufficiently rigid to deprive impoverished France of six million births."

Then there are other aspects of the problem to be considered, namely, public morals and national health. In discussing these "there can be no doubt," says the London *Lancet* "that an excess of women in the population conduces to irregular living, with its attendant diseases amongst those of a low moral standard. Others whose lives are regulated by the ideals taught in Christian countries may be expected to suffer psychically through the inevitable conflict between their sense of right and their unsatisfied sex instinct,"—a conflict that invariably must end in a multitude of psycho-neurotic conditions.

How is the problem to be resolved? Neither Dr Carnot nor the *Lancet* offers any satisfactory solution. The *Lancet* suggests the militarization of women! "The real situation," it states, "seems to be that society must discover some means of maintaining its sex proportion in the natural ratio of one to one. If war cannot be eliminated, then women might be enlisted on the same terms as men." Thus we see that, in addition to their patriotic motive, the Russian women's battalions appear to have been the result of an unconscious natural impulse to maintain the normal sex ratio. Dr Carnot

considers three alternatives for France (1) to marry French women to foreigners, and to encourage these to settle in France, (2) to permit polygamy for a certain period, and (3) to institute the matriarchal family composed only of mothers and children, many examples of which have appeared in the civilisations of the past.

None of these four solutions, we venture to maintain, will appeal to the highly individualized, fastidious and egotistical women of modern Europe, nor, in our opinion are they either theoretically or practically sound, or nationally expedient. For, militarization unless the result of a spontaneous national impulse in times of racial stress, is unnatural, foreign husbands to-day can only be obtained out of Europe—in the East for example—and the principle of miscegenation is wholly wrong, temporary polygamy is futile, for your modern man can hardly support one wife, while the institution of matriarchy, which Dr Carnot strongly recommends, needs a radical change in public opinion, with considerable State support and those who remember the wave of horror that swept over Europe at the mere whisper of that untolded rumour of the Russian "nationalization of women" will realise the difficulties in the way of the promotion of any successful degree of sociogamy—that condition of society in which the State assumes all the responsibilities of the head of the house.

In conclusion we would point to certain natural influences at work. We would note, for example that the present unrest in public morals is the reaction of war, and will vanish as suddenly as it appeared when the nervous health of the nations resumes the normal, that the very preponderance of women is an asset of value for the powerful selective factor of love to work upon, that a qualitative birth-rate is infinitely better than a quantitative one, and the sooner the masses are educated in the practical value of this important national fact, the better. That while the present shortage of food-supplies exists an unnatural stimulation of the birth-rate would be the reverse of good statesmanship, and that, finally, as sex disproportion is evidenced acutely only in the adult stage the more particular protection of the preponderant male births would appear to be not only the most natural but the sanest social remedy.

A CASE OF MELANCHOLIC STUPOR
(PSYCHOCOMA)

By O. St. JOHN MOSES, M.D. D.S.C. F.R.C.S. F.R.S. (E)
MAJOR, I.M.S.

IN his book on "Insanity in India" and under the heading of "Stupor," Ewens mentions "a condition of insanity" which he terms "not at all infrequent in Indian Asylums, of a very remarkable and distinctive character," and in the course of the chapter the author describes

some cases of the malady under the name of "Melancholic stupor" (*Melancholia attonita*, *Psychocoma*)

A noteworthy case of this type has recently been under observation in the Berhampore Lunatic Asylum, and the facts of it merit record. The patient was a Hindu male, aged about 42 years, who in 1917 suffered from melancholia, which in August of that year became psychocoma. For altogether two and three-quarter years, the patient lay in a state of utter stupor, without manifesting any change that was perceptible to the keen observers placed on watch over him. During the whole of the time, he lay on the flat of his back, in practically the same position, with his forearms flexed at the elbows, his hands flexed at the wrists and meeting over the sternum, and his legs drawn up in semi-flexion. All his limbs were as rigid as could be, and he resisted all efforts made, with any reasonable degree of force, to extend them. The muscles of the back and neck shared in this extraordinary stiffness, so that if he were lifted by the occiput, the entire head, neck and body could be raised as if he were a block of wood. His eyes in wakefulness were always wide open, and had a fixed, vacant, far-away stare, and the veins on his forehead stood out with a certain degree of prominence. There was an utter loss of volitional power. He passed urine and excreta in bed,—just as an unconscious person might do,—and seemed to feel no annoyance or discomfort owing to this circumstance. His expression remained exactly the same throughout,—utterly vacant. Words addressed to or shouted at him made not the slightest difference in his expression. On no occasion was he known to call for food or to manifest any desire for it, and never was he seen or known to help himself to any when food was placed beside him. All his food during this period was, of course, entirely liquid, and the feeding was carried out throughout his illness by means of the nasal tube. He offered no resistance except once for a few days when, for some reason which could not be made out, the muscles of his lower jaw became stiffened. To avoid injury rectal feeding was resorted to during this short time, for it became impossible to insert the nasal tube, as any attempt at doing so caused him to shake his head violently from side to side and thus eject the tube. Occasional attacks of diarrhoea were the only other untoward incidents in the course of the case,—they caused a slight fall in his body-weight from time to time, which was, however, made up in a few days on each occasion. His circulation remained moderately good throughout, and the reflexes remained normal. At no time were there any trophic changes of an undesirable nature, the patient keeping marvellously well-nourished and entirely free from bed-sores or any approach to these,—a circumstance which appears to be characteristic of cases of psychocoma.

He was visited by his mother in 1919, but he

seemed totally unaffected by the visit, being apparently unconscious of her presence as she sat beside him, her most affectionate addresses failing to elicit the slightest response. He appeared not to recognise that she was his mother.

On the morning of April 9, 1920, the patient suddenly awoke as if from a long dream. For the first time after nearly three years of the most rigid silence, he spoke in a feeble whisper and indicated his desire to write. He was given pencil and paper, and instantly, in a perfectly legible though somewhat shaky handwriting, he wrote in English a few lines which had a perfectly rational meaning. Thereafter he wrote in the vernacular that speaking was a great effort. Two days thereafter his voice was distinctly audible and his speech quite intelligible. He was able to sit up with help and to take semi-solid food, but appeared to be somewhat depressed. Before the week was out he was able to feed himself, and gradually attained to full vegetarian diet.

On questioning him I elicited the fact that he had only a very vague recollection of what had happened during the past three years, and of the people who had come to see him.

From time to time some persons suspected that a strong element of malingering was present in this case, but I think that even if it were so at the earliest stage, this man very soon crossed the border-line to insanity, this opinion I form on the ground of the extraordinarily consistent manner in which he kept up appearances during the two and one-third years in which I had the opportunity to observe him and his slightest doings, with the aid of a most watchful and intelligent staff.

He has steadily improved since the morning of his re-awakening, and his interest in life has gradually revived and his depression has become correspondingly less. He now smiles, appreciates a jest, reads the illustrated papers and magazines with pleasure, and aims at exercising his mind no less than the muscles of his limbs which have through prolonged disuse become inconveniently stiff. Massage and practice have restored his power of walking.

His recovery has been as remarkable in its suddenness as his entire illness has been in its mysterious nature.

A NOTE ON VACCINE THERAPY IN TYPHOID AND PARATYPHOID FEVER

By C J FOX,

MAJOR, I M D

Assistant Director, Pasteur Institute, Kasauli

It is many years since E. Fraenkel treated 57 cases of enteric fever with curative doses of vaccine. My attention was drawn to the subject by a paper in the *R A M C Journal* of 1906 by Major C. Birt. The following is an extract from his paper.

"In a long forgotten paper which appeared in 1893, E Fraenkel reported the results of treatment of 57 cases of enteric fever with the subcutaneous inoculation of the typhoid bacillus which had been sterilised by heating to 63° C. Fraenkel satisfied himself that good results from this method in the majority of cases and that the fever was aborted in many."

Birt goes on to quote cases of other bacterial infection which have benefited by injections of sterilised cultures of the causal micro-organism during an attack of the disease, e.g. Malta fever. He recommended doses of 10 million bacilli in typhoid fever, regulating the dosage and intervals by the opsonic index or Bordet and Gengou test for fixation of complement. The theory put forward was that the micro-organisms causing the disease did not incapacitate all the defensive forces of the body in the same degree. Therefore it was possible to obtain reactivity and antibody production at a healthy site in order that these may be carried to the site of infection and kill the living bacteria there. Birt recommended further work being done.

Sir David Semple in 1909 (*Lancet* June 12th, 1909), treated nine cases with very good results. Two of his cases were treated with autogenous vaccines and judging by the better results obtained, and the consensus of opinion then being in favour of autogenous vaccines over stock vaccines, he strongly recommended autogenous vaccines where practicable. He regulated dosage by the opsonic index.

W H Walters and C A Easton of Boston University reported thirty cases of enteric fever treated with subcutaneous injections of a stock typhoid vaccine sterilised at 60° C for twenty minutes and preserved in 0.3 per cent lysol, 15 to 70 minims of a stock emulsion were given. In nearly all the cases a decline in the temperature was noted confirming Fraenkel's original observations.

W P MacArthur treated 63 cases of enteric fever in Mauritius with vaccine. From 61 of the 63 the causal organism was isolated either from the blood or from the faeces. The cultures from the other two cases were negative, but there was no doubt about the diagnosis. There were only 2 deaths, or a mortality of 3.1 per cent, which is very low. The dosage varied with the age and condition of the patient. For adults the dose was 150 to 300 million. Increasing doses were given at 2 or 3 days' interval. In 45 cases treated before the tenth day of the disease no relapses or complications occurred except a case fatal from broncho-pneumonia. In 11 others the patients had been ill for a fortnight. In several of these complications arose, and there was one death from hæmorrhage. In most cases a stock vaccine was used.

The papers by Birt and Semple made a

great impression on me, and I have since treated 12 cases of enteric fever with typhoid vaccine. As I had no opportunity of treating cases in a hospital I had to fall back on such cases as might occur in private practice. There was, and still is a prejudice against the use of curative doses of vaccine in cases of typhoid fever among general practising physicians and for which they really cannot be blamed. For one thing, though the theory will appeal to them, they require proof first. They judge by results and as the cases so far treated are so meagre in numbers they cannot be expected to get quite enthusiastic in the matter and demand curative vaccine treatment for their cases of typhoid. On the other hand, how is the vaccine therapist to give him results unless the physician provides him with patients? There must be co-operation, and this is the object of this note—to crave a fair trial for curative typhoid injections during the fever. I am absolutely convinced from the cases (though few) that have been treated and from my personal experience, that this form of treatment will cause a remarkable lowering of the death rate from typhoid fever, and during this time of war and the value of man-power every life saved in the army means much to the State. The cases treated by me in over 5 years numbered twelve. Of these three were Europeans and the rest Indians. The conditions under which they were treated were the most unfavourable possible. None were in hospital. The three Europeans and one Indian had the benefit of intelligent relatives to nurse them. The other cases lived in crowded bazaars and in the usual insanitary surroundings as regards fresh air and accommodation. The only death was a case in the third relapse, complicated with cholecystitis, and in which vaccine was really not indicated but in which the relatives insisted and two doses only were given of 2½ millions each the second dose the day before death. In the remaining cases the temperatures of all consistently fell till the cases were just those of an uncomplicated fever. The last case treated was clinically in a very serious condition. It was the 15th day of disease—pulse 140 and running-respirations, 60—both lungs pneumonic—low muttering delirium diarrhoea (12 to 14 motions passed involuntarily daily), and tympanites. In this case small doses were given combined with pneumococcus vaccine, and the child made a good recovery. But only three doses of vaccine were given. The doctor in attendance did not advise any more as the temperature had subsided. When the child had been normal for six days the parents bathed him and he got a relapse. Vaccine was immediately recommended and four doses given, although the temperature came down again to normal after the first of this series of

doses These results were obtained under the worst possible conditions What may we not expect from the same treatment under better conditions such as are usual in Station and other Civil Hospitals with good and careful nursing? Apart from the reduction of mortality there is the question of carriers which is a very serious one These I believe can also be lessened in number, if not altogether prevented, by early diagnosis and early vaccine treatment For the carrier is so often a case that has not run a very severe course In such cases one is led to believe that there has not been a great demand for antitoxin or bacteriotropic substances, and therefore the response has been just sufficient to tide the patient over the attack but not sufficient to destroy all bacteria or prevent them from remaining in the gall bladder or intestines If only it were to reduce the carriers, vaccine therapy is worth trying In addition to the 12 cases quoted I had one case of cholecystitis, with a low temperature and gastric disturbances for 5 months after an attack of paratyphoid B and which yielded readily to paratyphoid vaccine One's only opportunity of clearly demonstrating the efficacy of vaccine therapy in typhoid fever to the profession is to give this form of treatment a fair trial in a large hospital, either military or civil, preferably the former With a very small camp laboratory it would be an easy matter to obtain a blood culture from a case in order to diagnose the causal organism early, a dose of stock vaccine being given if positive to typhoid and an autogenous vaccine prepared within 72 hours But the chief reason for an investigation is to evolve, if possible, a stock curative vaccine which could be used with safety by all medical practitioners As I said before, I am convinced this method will yield excellent results

NB—The above note was written in 1917 What was urged in it is, if anything, emphasised now except for the urgency of the man-power during the war Typhoid continues to occur in the army, though the death rate from this cause is not very noticeable There is always the vexed question of carriers and what is to be done with them It has, however, apparently become more common among Indians But how far it has affected Indian troops I am not aware I would therefore urge that the advocated investigation may be systematically carried out, so that the profession may have reliable numbers from which to judge of its efficacy or otherwise

SODIUM MORRHUATE AND SODIUM HYDROCARPATE IN LEPROSY

By P GANGULI,

TEMPY CAPTAIN, I M S

I TOOK over charge of the Isolation Block 33rd I G N in August, 1919 There was one leprosy case under observation at that time, and I began to treat him with intravenous injections of sodium gynocardate A (or, more correctly,

sodium hydriocarpate) which has been the recognised method of treatment since its introduction in 1915 by Sir L. Rogers I beg to acknowledge my grateful thanks to Captain D C Cooper, I M S, for kindly drawing my attention to an article in the *Indian Medical Gazette*, written by the same authority, in which he described the action of sodium morrhuate on leprosy I took up the investigation of the action of this drug on leprosy on the 28th August, 1919

Besides the case noted above, four more lepers were admitted in the Isolation Block, and I am indebted to Captain Fettes, R A M C, the Dermatological Specialist, Quetta, for confirming the diagnosis

The following types of leprosy were treated —

I	Mixed Nodular and Maculo-Anæsthetic Leprosy	2
II	Pemphigus Leprosus	1
III	Nervous Leprosy (Pure)	2
Total		5

It is necessary to give a somewhat detailed description of each case to follow the significance of the action of the drugs

I MIXED NODULAR AND NERVOUS TYPE

CASE I—D B "M" of 4th A B C, aged 20
Family history—His uncle is a leper

History—He had an attack of prodromic fever about a year ago, followed by general weakness loss of appetite, tingling sensation in the hands, incessant cough and dryness of nostrils After four or five months, he had another attack of fever, followed by a macular rash on the posterior aspect of the right elbow and forearm, dorsum of the left hand, nose, right temple, and front of the right leg, a few days later there was loss of tactile and thermal sensation, which became so intense that he once burnt his finger without being conscious of the heat, then he noticed gradual loss of muscular power of the hands, wasting of the muscles of the thenar and hypothenar eminences, followed by trophic ulcers on the index and middle fingers, the ring and little fingers became gradually distorted After a short time nodules began to appear, first on the borders of the macular patches and then on the nose which broadened out He showed all the above signs when I saw him first in August Besides these, his ulnar nerves were greatly thickened and there was paresis of the median nerve, as shown by the total loss of the power of movement of the thumb and index finger There were also changes in the appearance of the nails

Treatment—Sodium morrhuate treatment was begun from 28th August, 1919

Re-action—Patient developed asthmatic lung troubles (which might have been inter-current) after each injection, râles and rhonchi were audible throughout the chest These subsided

gradually after a few days of rest. Lately, however, this patient is bearing the treatment without any re-action.

Iction—The action of sodium morrhuate was remarkable on the maculo-anæsthetic patches, and also on the various nervous disorders. Sensation over these patches began to return within a fortnight after the first injection, the thickening of the ulnar nerves has become less and the paræsthesia of the median nerves has disappeared.

As this drug however did not produce much effect on the nodules, and as he began to get fever when the dose of 3½ cc was reached, sodium hydriocarpate treatment was begun with appreciably better results. The patient is still under treatment.

CASE II—D B R of 4th A B C

History—The disease began a year ago, with enlargement of the lymphatic glands on the right side of his body, viz., in the posterior triangle of the neck, the axilla, the epitrochlea and the groin. The only glands which were enlarged on the left side were situated in the inguinal region and Scarpa's triangle. These particular glands supplicated and had to be operated on at Turbat in East Persia, in the month of January, 1919. The ulcer, however, remained indolent and unhealthy and had to be scraped on 20th April, 1919. A few days before this, he had an attack of fever which remained continuous for about a week with profuse sweating and itching all over the body which was followed by extensive erythematous eruptions. These rashes were first noticed on the back and face, and then gradually came out all over the body except the scalp, inter-scapular space on the back, the palms and the soles. The hair of the eyebrows began to fall out from the external parts. In July 1919 nodular deposits began to form in the deeper layers of the skin of the face, and also in the ulnar, median and posterior tibial nerves. By the middle of August, 1919, his eye-brows, nose and lobules of the ear had become thickened and his face had assumed the characteristic leonine appearance. His nasal septum became ulcerated and there were several attacks of epistaxis. *Lepra bacilli* were found in large numbers in the nasal secretion.

Progress—Curiously enough, the nodules of the skin began to be absorbed spontaneously, and when he arrived in Quetta on the 7th September, 1919, the nodules of the face were already disappearing, leaving very brittle patches of skin. The lobules of the ear, especially the right one, were still pendulous and thick. The skin of the affected parts was only slightly anæsthetic, but had lost its elasticity and cracked at the slightest pressure.

Treatment—Intravenous injection of sodium morrhuate was begun from the 8th September, 1919.

Re-action—As there was hæmoptysis after the dose of 2 cc of the 3 per cent solution, sodium morrhuate was stopped, and sodium

hydriocarpate was given for six weeks. Sodium morrhuate injections were resumed from 1st January, 1920.

Iction—Sensation in the affected patches began to return within a fortnight, the nodules disappeared within a month, the skin of the affected parts gradually recovered its elasticity, the thickening of the nerves are no longer apparent, the red shining discolouration is gradually fading from the margins of the lesions. The redness of smaller patches has gradually become whitish in colour and faded into the normal colour of the skin, the patient's general condition has remarkably improved.

II PNEUMICUS LEPROSUS

CASE III—Labourer "M" of 107th L C

History—This man gave a history of fever in September 1919 three days before eruptions appeared on the body. The eruptions were at first of erythematous type, and spread over the whole body. After four days, bullæ of various sizes appeared all over the body except the scalp, the palms of the hands, and the soles of the feet. After three or four days, these bullæ began to burst leaving red surfaces, which subsequently dried up and exfoliated. At this time he suffered from intolerable itching, which subsided after a fortnight, the patches becoming anæsthetic. The hair became thin in the eyebrows, and totally disappeared from the upper lip.

Three years before the above incident, he suffered from an attack of prodromic (?) fever, followed by tingling sensation in the hands. Within a few weeks he noticed anæsthesia in the palm together with the loss of muscular power of the hands. This was followed by wasting of the muscles of the thenar and hypothenar eminences and distortion of the fingers. The ulnar nerves were thickened and the distortion of the little fingers was most marked.

Treatment—Intravenous injection of sodium morrhuate was commenced from 7th October, 1919. The patient developed colitis, passing mucus and blood. Sodium hydriocarpate was begun from 11th October, 1919. Sodium morrhuate treatment was resumed from 1st January, 1920.

Iction—The patient's condition improved remarkably under sodium hydriocarpate treatment. The discolouration of the skin totally disappeared, but there was no sign of improvement in the muscular power of the hands or in the thickening of the ulnar nerves, the distortion of the fingers remained as before. Sodium morrhuate is now being given a trial with the idea that its fibrolytic action may restore the function of the nerves, even if they are totally destroyed, so long as the central cells remained unaffected.

III NERVOUS TYPE (PURE)

CASES IV AND V—Gunner "M K" of 38th M B, 14664 Lab "B," of 107th L C

History—Both these patients had prodromic fever in June, 1919, which lasted for 10 days. Within a week after the cessation of fever, they noticed pain all over the body, tingling sensation in the hands and feet, followed by erythematous rashes on the nose, the hands, the legs, and the trunk. Gradually these patches became totally anæsthetic. This loss of sensation extended deep into the tissues, so that the patients could not feel heat, pinching, pressure, or pain, even when pins were stuck deep into the muscles. Simultaneously, they noticed loss of muscular power in the hands, distortion of their fingers, wasting of muscles of forearms and the thenar and hypo-thenar eminences, so that in both the patients the typical "Main-en-griffe" resulted.

Treatment—These two persons were treated with sodium hydnocarpate from the middle of October to the end of December, 1919.

Action—Both deep and superficial anæsthesia have almost disappeared from the affected patches.

As, however, no improvement was noticed in the distortion of the fingers and loss of muscular power, intravenous injection of sodium morrhuate was commenced from 1st January, 1920.

GENERAL REMARKS

(1) Comparative value of sodium morrhuate and hydnocarpate—

Both sodium morrhuate and hydnocarpate have got a remarkable action on the maculo-anæsthetic type of leprosy. It is too early to state the comparative importance of these two drugs in the treatment of various types of leprosy.

(2) *Mixed treatment*.—In all the cases noted above, I wished to investigate the action of sodium morrhuate alone on the various aspects of the disease. I was however compelled to fall back on sodium hydnocarpate for three months (September, October, and November, 1919), as sodium morrhuate was not procurable. In two cases, I had to stop sodium morrhuate treatment on account of undesirable reactions.

It was noted, however, that mixed treatment with both drugs produced very desirable results. It was also noted that where sodium morrhuate failed to quickly reduce the nodular deposits, sodium hydnocarpate succeeded. I cannot say whether this was due to increased resistance of the bacilli to the drugs after a time or otherwise. Again, sodium morrhuate appeared to be the more powerful of the two drugs in combating nervous symptoms.

(3) *Dose*—The initial dose was $\frac{1}{2}$ c.c. of the 3 per cent solution, gradually increasing by $\frac{1}{4}$ to $\frac{1}{2}$ c.c. weekly till the maximum of 5 c.c. was given in each dose. This dose was repeated weekly till cure was effected. It was noted, however, that no ill effects were produced by the interchange of drugs so far as the increment of doses was concerned, that is to say, if a patient was able to bear 3 c.c. of sodium morrhuate solution he could bear the next higher dose

($3\frac{1}{2}$ c.c.) of sodium hydnocarpate in the next injection.

(4) *Conclusion*—All these patients are improving in every respect. A further report will be submitted later on.

N.B.—Out of the five cases noted above, three cases were discharged as cured by a medical board. The two remaining cases are practically cured and it is expected that they will be put up before a medical board within a month.

NOTE ON A CASE OF HYDROPHOBIA

By S. AMRITARAJ, L.R.C.P. & S. (Edin), D.P.H. (Cantab)

On the 6th instant one Arokiasawmy, an Indian Christian boy, aged 10 years, was brought to me by two Indian officers of the 2nd Q.V.O. Sappers and Miners to be sent to Coonoor. The Civil Hospitals would not admit the patient as he was just beginning to become violent. No secure accommodation being available in the isolation hospital and as the case was beyond hope, the boy was confined in a secure room (store room) in the Municipal Veterinary Hospital.

As all dog-bite cases are reported to me, this case was brought to me, but unfortunately nothing could be done.

The boy when seen by me, at about 4 in the afternoon of the 6th instant, had all the symptoms of hydrophobia, namely, slight tremors of the body, spitting of viscid saliva, occasional barking noises (which increased later), marked repulsion at the sight of water. Grinding of the teeth and clenched fists were also noticed. No paralysis of the body muscles was present at the time.

He asked for tea and biscuits, which on being given he would not take, though he attempted to eat the biscuits. Milk and tea, when offered, was also rejected.

He was practically conscious but looked frightened. His speech was quite audible and distinct, but at intervals the voice was hoarse. Clenching of the hands, grinding of the teeth, staring eyes, and frequent spitting of viscid saliva were the most marked characteristics. Spasms of the arms and face were also present at intervals. He was able to walk about and sit down.

History—No details could be got from the parties that brought him and, besides, no relatives could be traced. The boy on being asked when he was bitten by a dog pointed his three fingers but could not properly express himself.

There were recently healed scars, three in number, on the right side of the face—

(1) One on the temple about quarter inch square.

(2) Two scars on the upper maxillary region—one about one-sixth inch square and the other circular, half inch in diameter.

When I saw them, I noticed no raw surface of any kind, the wounds could not have been more than three weeks old—at the most a month. The skin surface was clean and smooth but of a light fleshy colour. From the appearance of the scars the wounds must have been more than skin-deep—evidently punctured.

Treatment—Nothing could be done at this stage. Chloroform inhalation was tried but the patient would not allow any one to go near him with anything and, besides, the attendants were also afraid to handle him as he was attempting to scratch them.

He was gradually persuaded to enter the isolated room selected, where food stuffs, milk and coffee were left, and was locked in. This was at 6-30 p.m. (2 hours after he was brought to me) and four attendants were kept in the next room to watch him overnight. At this time he was getting rather violent with a tendency to attack any one that went near, and on this account no morphia injection could be given.

Bromide of potassium (30 grains) in bread bolus was given him to swallow but after some attempts he threw it away. So nothing further was attempted and he was left to himself, unfortunately, for death to put an end to his sufferings.

I watched him after being locked in for half an hour, except for feeble barks and the spitting sounds and occasional cries, he appeared fairly quiet.

I again went over at 10-30 p.m. with two other medical friends. We got no response in the way of talk except the barking and spitting sounds. The attendants informed me that during this interval (i.e., 6-30 to 10-30 p.m.) the patient appeared to be quiet.

After 12 midnight, according to the information of the sanitary overseer and the attendants, the boy began to bark loudly and shout and they thought he was restless. At 5-30 a.m. the next morning this stopped, and they waited an hour and hearing no movements or sounds it was presumed that death had occurred. At 7-30 a.m. the veterinary inspector arrived and opened the door and found life extinct, the body was found in the bent posture with the forehead on the ground.

The body was handed over to the Roman Catholic Priest, after intimation to the Police authorities, who had the corpse buried at 9 a.m.

Death had probably taken place about 12 hours after admission, and it might be presumed that from the onset of the initial symptoms till death, the time must have been about 24 hours.

I am reporting this case as it came to my notice for necessary action as Health Officer. This was the second case that I had personally to deal with during the past nine years, the first one being an old municipal sweeper who died within six hours of the onset of the symptoms of the disease (about 8 years ago), though five other deaths from hydrophobia were reported during this period (one military,

and the other amongst the civil population), which were treated by private medical men. In all these cases the persons in immediate attendance on the deceased persons proceeded to the Pasteur Institute for treatment (at Coonoor). Three of these were neglected dog-bites and amongst Europeans.

In the case under report, I examined all the attendants and found no necessity for any one to be sent to Coonoor.

It was a most pitiful case, especially for a medical man, to see that nothing could be done. The only lesson is that, with the only means available at present, namely, immediate resort to the Pasteur preventive treatment, no cases of dog-bite should be treated lightly and prompt antirabic measures should be taken by medical officers of health.

Municipal authorities should have much more stringent regulations for granting dog licenses. The dog taxes now levied are far too small, varying from one to three rupees at the most per annum, while no sufficient safeguards and restrictions are enforced in most cities and towns. The time has now come to adopt the British methods of control over dogs.

The primary danger in municipal towns is the large number of stray unhealthy and half-starved dogs coming in from the surrounding villages. The other difficulty is the sentimental objections raised by owners of dogs against municipal regulations.

Lastly, it is highly desirable that more Pasteur Institutes should be opened at suitable centres as at present there is only one for the whole of Southern India at Coonoor, in the Nilgiris. A good number of illiterate people, on account of distant travelling still neglect to report cases of dog-bites, in spite of railway concessions and other facilities. I have had a couple of instances where pressure had to be put on through the District Magistrate by Police summonses.

NOTE II

In the civil and military station Bangalore, certain byelaws are in force. But the practice of poisoning dogs on the roads has been discontinued. An electrocuting apparatus is being designed for destroying dogs, as strychnine poisoning, now used, causes much suffering to the animals. Experiments showed that death was instantaneous and caused no pain. Korava dog-catchers are employed throughout the year who catch on an average 2,000 dogs yearly, of these about 1,500 are destroyed.

As regards dog-bites, most cases are reported promptly to this office. The instructions given by the Director, Pasteur Institute, are observed in every case. In cases where biting dogs are not traceable, parties are invariably sent to Coonoor. The average number of dog bite cases reported at Health Office is 15 per mensem, and of these about 30 per cent are due either to known rabid dogs or non-traceable animals believed to be rabid.

BACTERIOLOGICAL INVESTIGATION OF NORMAL AND DISEASED EYES

By CHARU CHANDRA SINHA, I.M.S.,
Teacher of Pathology and Bacteriology,
Dacca Medical School

LAST YEAR, at the suggestion of Lt-Col E. A. R. Newman, C.I.E., M.D., I.M.S., I examined consecutively the eyes of 100 men, of whom 53 were Hindus and 47 Mahomedans, they were all males, except 8 or 9 who were adult females. The results noted at the time are as follows—

Disease	Number of cases	Number of eyes examined	Organism found
Cataract	18	30	Staphylococcus albus 20 " aureus 2 Streptococcus 1 Pneumococcus 2
Trachoma	8	12	Streptococcus, diplobacillus, and staphylococcus
Leucoma	5	7	Staphylococcus
Panophthalmitis and staphyloma	6	10	Staphylococcus aureus
Ophthalmia and conjunctivitis	9	15	Gonococcus, staphylococcus, influenza bacilli, pneumococcus and a thick diplobacillus
Corneal ulcer and keratitis	8	10	Staphylococcus aureus Pneumococcus and streptococcus
Lachrymal obstruction with abscess	7	10	Pneumococcus and staphylococcus
Pterygium	6	9	Staphylococcus
Blepharitis	5	8	Staphylococcus
Normal eyes	28	56	No organism staphylococcus thick diplobacillus

In every case I took a smear on a slide, and made a culture on an agar slope. By touching the selected area, or the diseased area such as an ulcer, etc., with a tiny sterile swab, the reflex rolling of the eye-ball spreads the organism into the small swab. This is used to inoculate the agar tube and prepare a film for staining. At times a second swab is necessary to make the film preparation. Often the same swab succeeds in serving both purposes. Two films, one from each eye, may be stained on the same slide a little apart from one another. In the absence of sterile swabs platinum loops were used. These were made of delicate fine wire, with no projecting cut end, i.e., both ends twisted together to meet the glass rod.

Sometimes a culture gives a negative result, while the film made from the same source shows some organisms. It would appear that microscopical examination of a stained film is generally sufficient for the clinical diagnosis of cases. It was found after using different kinds of stains that Löffler's methylene-blue is a good stain suitable for most of the cases. Samples were easily obtained from diseased eyes, with ulcers, etc. In normal or congested eyes, having little or no discharge, the swab sometimes fails to catch organisms from the conjunctival sac. In such cases the inner canthus shows organisms. It was found that this spot is practically never free from micro-organisms. But it is difficult to get the pure causal organism there, because it is

often found mixed with other skin cocci (mostly staphylococci) at the mucocutaneous junction.

Eighteen men with cataract were examined, some had cataract in both eyes, others in one eye only, the remaining eye being either unaffected or already operated on for cataract. The samples of discharge were obtained from these eyes before they were subjected to preliminary preparation for operation, i.e., protargol eye drops for a few days. Staphylococcus albus was found to be the commonest in most of them. Staphylococcus aureus was seldom found, and then those eyes showed some amount of inflammation. Two cases out of this group showed pneumococci and streptococci. It is interesting to note that, along with other healthy cases, these infected eyes, after passing through the usual routine preliminary preparation before the operation, i.e., protargol drops for a few days, were operated on and went home cured. Thus it appears that the presence of pyogenic micro-organisms, even pneumococci, is no contra-indication to cataract operations, provided the patient undergoes systematic treatment preliminary to operation.

The next group of cases were those having other eye diseases, mostly belonging to the outdoor dispensary, some from eye ward and other sources, the cases being common eye diseases like conjunctivitis, corneal ulcers, lachrymal abscess, pterygium, trachoma, etc., etc.

Conjunctivitis and ophthalmia cases—These show gonococci, influenza bacilli, pneumococci, staphylococci, and thick diplobacilli. At times the smear preparation fails, while the culture shows organisms. But often the film preparation is very useful because it shows a greater variety of organisms than the culture. The reason is probably that either the same medium is not equally suitable for all kinds of micro-organisms, or the stronger variety of organisms overgrow the weaker kinds. Therefore, the smear gives a better picture of the relative frequency of different organisms present in a case of mixed infection.

Trachoma—In trachoma, too, staphylococci are very common. Some cases show streptococci in addition.

Blepharitis—The few cases that were examined were in both stages—inflamed and suppurating. They showed staphylococci only.

Lachrymal obstruction and abscess—These cases showed pneumococci in addition to the usual staphylococci.

Corneal ulcers—These cases present some difficulty in taking the swab, because the smallness of the affected area, unsteadiness of the eye-ball and photophobia work together to throw difficulties in the way of the worker. When a film is stained, staphylococci are mostly seen. In two severe cases pneumococci were found, both showed progressive spreading ulcer with threatened prolapse of the iris. Thus it seems that the common mild form of corneal ulcers, including the traumatic variety, that often

appear in the out-door dispensary, are infected with staphylococci while severe spreading types are complicated with other organisms like pneumococci and streptococci. Because the corneal ulcer appears in a short time, common people call it "touch of wind". In Dacca, particles of steel and conch-shell accidentally introduced act as foreign bodies. These accidents are often followed by ulcers. They are found in people who work in conch-shells—called *Shakhari*.

A few healthy eyes were examined from in-door patients of surgical and medical wards of the Mitford Hospital. In many of them staphylococci were found. Those persons having infected eyes were found to suffer no inconvenience. Perhaps they were immunised as a result of chronic mild infection and the bacteria or cocci had lost their pathogenic power. This is particularly noticed in cases showing thick diplobacilli of the Morax-Axenfeld type. This organism, besides healthy eyes, was found in mild conjunctivitis cases. They were easily cured by the ordinary zinc or alum boric eye drops of the Mitford Hospital. As staphylococci are very common in healthy eyes, it is doubtful whether they can cause conjunctivitis on unbroken surfaces. If they do perhaps they are those mild chronic cases.

OBSERVATIONS ON THE TREATMENT OF HOOKWORM DISEASE

By BABU HIRA LAL,

Medical Inspector, Jharia Mines Board of Health
(Submitted by Dr G W Thompson, Chief Sanitary Officer, Jharia Mines Board of Health.)

THE investigation and treatment of cases of hookworm disease has been carried out on Rhowra Colliery under the supervision of the Jharia Mines Board of Health during the months of April, May and June, 1919. In all 759 samples of stools were examined and 451 of these proved positive. Of the infected persons 109 voluntarily presented themselves for treatment with thymol.

The drug was administered to adults in two successive doses, each containing 30 grs of thymol together with an equal quantity of sugar of milk, the interval between administration was two hours, and the purgative used was mag sulph, in two doses, one before the administration of thymol and the other one afterwards. The following facts were observed—

1 That symptoms of mild poisoning, such as headache, giddiness, nausea and vomiting, weakness, palpitation of the heart, weak pulse, were more marked in the early cases when the dose of mag sulph was $\frac{1}{2}$ oz, than in later cases, when the dose had been increased to 1 oz.

2 It was noticed that if patients were allowed to drink copious draughts of water during treatment, vomiting was fairly frequent, but if the water was only given in small quantities to allay thirst, vomiting was absent.

3 The first patients treated were accommodated in a building not well suited for the

purpose, in that ventilation was not as good as it should have been, the later ones were accommodated in a much superior room, and it would appear that free ventilation forms an important part in preventing toxic symptoms.

4 With regard to dietary, vomiting and nausea were much more frequent when rice, dal and curry were given, and were practically absent when a meal of bread, curry and tea without milk were substituted for the first-named diet.

5 The most striking observation was that in eight of the cases which were treated, the patients before treatment, suffered from night blindness, and the treatment resulted in a complete recovery from this defect. These patients were the only ones, among the 109, who suffered from night blindness, so that recovery was cent per cent, and was complete two or three days after the first administration of thymol.

It would be interesting to ascertain whether other observers have noticed any association between hookworm disease and night blindness, and whether in their experience treatment with thymol has been curative of the latter defect. If this troublesome complaint can be cured by such a simple method as the administration of thymol, the benefit to be conferred on the population of this country generally will prove enormous as in some districts more than half the population suffer from night blindness.

ORGANO-THERAPEUTIC TREATMENT OF MALARIA

By A J NORONHA, M.D.,

Hon. Physician J J Hospital, Bombay

TWELVE bottles were supplied for trial in my wards of the preparation named Bazogen, purporting to consist of the extract of *Spleen*, *Pancreas*, *Thyroid*, and *Adrenal*. The supply of the drug was limited, and a fair trial could not be given. The accompanying charts show that a drop in the temperature occurs even in severe cases with the drug alone. Two cases were kept on Bazogen for some time. One was a case of malignant malaria and the other of malarial cachexia. In the former the temperature recurred as soon as the drug was stopped. In the latter the spleen diminished a little and then enlarged again. In a third case of malarial cachexia the spleen remained unaffected, but the treatment could not be prolonged.

It was not possible to determine the effects of the tablets on the parasites in the *peripheral circulation* in every case but in the two cases examined the parasites were not found in the blood (taken at various intervals) after a prolonged search.

CONCLUSIONS

From these few cases it may be surmised that the temperature drops in every case on the administration of these tablets. It seems probable that beyond a temporary check on the activities of the parasite no special action exists, although a more extended trial may possibly justify a contrary opinion.

HAZARIBAGH A POPULAR HEALTH RESORT

BY ASHUTOSH ROY, L.M.S.,
Hazaribagh

I—INTRODUCTION

I HAVE often been asked by my friends, who want to come here for health or pleasure, to supply them with various information regarding our pretty little town. I also know of cases sent from Calcutta or elsewhere which are quite unsuitable for climatic treatment here and go away disappointed. As there is no book giving detailed information of the various health resorts that abound the length and breadth of India, it is very desirable that members of our profession, whose field of work is located in the various sanitariums in the plains and the hills, should send as much information as they can gather for publication in the various medical journals regarding their own stations, so that the profession will have at their disposal ample materials to enable them to select a particular locality for every individual case. It is mainly with the object of stating the advantages and limitations of Hazaribagh as a sanitarium that I have ventured to send the following for publication.

II—LOCATION AND DESCRIPTION OF THE TOWN

Hazaribagh, the headquarters of the district of the same name, is a pretty little town "situated on the topmost central plateau of the district in the midst of a group of conical hills," which with the gentle undulation of the soil adds to the picturesqueness of the scene. It has an elevation of about 2,000ft above the sea-level and is situated in 23° 59 min north latitude and 85° 27 min east longitude. Originally a military cantonment station, the town is well-laid-out with broad roads, lined with trees on both sides, and some portions of it look like so many parks. The roads are, as a rule, clean and free from dust, often intersecting each other at right angles, and very good for cycling and motoring.

The town itself may be roughly divided into three portions—

(a) *European quarter*—Situated on the east-north-east portion of the town, is scrupulously neat and clean, with broad roads and pretty bungalows in the midst of big compounds.

(b) *The Bazar or the Indian quarter of the town* is divided into squares, each house facing a road with a lane behind. The houses are close together and the back lanes are often dirty. Occasionally a square here and there (especially in Bara Bazar, the oldest portion of the Indian quarter) is a big "bustee" with zig-zag lanes, often narrow and dirty. As a rule, however, the town is orderly, spacious, well-drained and practically free from those areas of congestion which disfigure so many Indian towns.

(c) *Nawabgunj*—Situated on the north-west portion of the Bazar, is the cleanest and healthiest part of the Indian quarter. Here the

houses are, as a rule, "pucca," with fairly good compounds in imitation of the European quarter, except the old "bustee."

On the south and south-east corner of the town, there are plenty of uplands very suitable for building houses, and now that the question of rent is settled by Government, it is hoped that the town will rapidly grow in that direction.

The District Gazetteer, Hazaribagh, gives the following excellent description of the town—

"The town is the meeting place of three first class roads, of which one connects it with Ranchi, fifty-eight miles away, and the other with Bagodar, thirty-two miles, and Burhi, twenty-three miles respectively, on the Grand Trunk Road, as a centre for motoring it is unsurpassed in the two provinces." There are three other second class roads, one going to the south, the Barkagaon Tandwa Road, and two others going to the west, the Lepo Road and the Katkamsandi Road. "The nearest railway station is at Hazaribagh Road on the Grand Chord Line, E. I. Railway, which is reached by means of the public service of motor cars in about three hours and the journey to Calcutta takes about seven hours more." The road from the station to the town passes through one of the picturesque portions of the district. "The accommodation provided for travellers consists of a Dāk Bungalow at the railway station for Indians and another at Bagodar, eight miles on the road to Hazaribagh where rooms and food can be obtained for Europeans. At Hazaribagh itself there is a staging bungalow near the church, which also provides room and food." There is also a hotel for Europeans.

III—PICTURESQUE HAZARIBAGH

Nature and art have combined to make the town one of the prettiest and healthiest spots in this part of India. Here are, for example—

(a) *The Gibraltar Hill*, on the north-east corner of the town, so called by Europeans on account of its fancied similarity in shape to the "Gibraltar Rock" of Europe. It is one of the conical hills mentioned above. If one ascends the summit, which is not very difficult to reach, a beautiful panorama is spread before the eyes. The scenery round about the hill is very pretty, and there is a road round the base, good for motoring.

(b) *The Bamanbay Hill*, about a couple of miles from the town on the south-east corner, and a quarter of a mile from the Hazaribagh Ranchi Road, is another pretty spot near the town.

(c) *The Chandwar or Seotagorah Hill*, the largest and biggest with an elevation of 2,815 feet, is three miles to the east of the town and a couple of miles to the south of the road leading to the railway station. At its base is situated a branch of the Calcutta *Punjabpole* "for the reception of old and worn-out cattle, of which a very large number are to be found in the adjoining pastures."

It may be noted that these hills unlike those of Ranchi which are bare are covered with a shrubby undergrowth and appear pleasing to the sight, though rather inconvenient to the hill climber.

(d) *The Lake*—There is a big artificial lake and two smaller ones in the centre of the European official quarter. Here are, for example, the Deputy Commissioner's quarters, the Civil Surgeon's quarters, the Reformatory School and its Superintendent's quarters, while the Circuit House and the Central Jail are close by. Round the big lake is a good road for promenade. The surrounding scenery is excellent.

(e) *The Public and other buildings*—(1) The St. Columba's College building is a group of grand and picturesque buildings consisting of the college building proper with its three attached blocks which serve as hostels for students and the new science block recently built. The buildings are situated in the midst of extensive grounds, amidst picturesque surroundings about half a mile from the town. The hostel arrangement is excellent, each student getting a single room with a bedstead, a stool and a table. The college attracts a large number of students, not only from neighbouring districts, but also a fairly good number of students of indifferent health from Bengal. (2) The Zenana Mission Hospital under the charge of European Lady Doctors, is doing very good work amongst the Indian pardah ladies here. It has an indoor and outdoor department. Few district towns, not only in this province, but elsewhere in India can boast of a college and a zenana hospital, and the townsmen are extremely grateful to the members of the local Dublin University Mission for the very good work which is being done at the above two public institutions here. (3) The Reformatory School building is another group of grand buildings situated on the lake. (4) The Police Training College building is another grand building, though belonging to a private person. (5) Amongst private houses the only one that needs mentioning here is Mr. Mullick's fine mansion situated near the Gibraltar Hill.

(f) *The topmost plateau* is about 40 miles east and west and 15 miles north and south. The District Gazetteer for Hazaribagh gives the following excellent description of the scenery—

"The surface is nearly level and the undulations usually gentle. Near the headquarter station a few rocky hills break the sky-line, and in the distance appear the summits of cliffs which skirt the edges of the plateau. It is at the end of the rains in late October and November that the landscape is most attractive. The rice in the terraced valleys is turning into yellow and the grazed uplands are still tinged with green. Interspersed are great blotches of pale gold where fields of Surguja fringe the rice-lands or penetrate the glade of sal-wood, and the distant horizon is broken by misty violet hills. The

days are largely warm and the nights cool." Near the edge of the plateau the descent is generally abrupt except towards the west, and the scenery grand. One meets with beautiful forest clad valleys on all sides from the edge of the plateau for example, Velloara on the east, Kukum-sindi on the west, Mourangi on the south and Signa on the north, situated near the various main roads which traverse the district from the headquarters station.

IV—METEOROLOGICAL ASPECT

Formerly Hazaribagh was a second class meteorological station "at which hourly observations were registered four days in each month, in addition to two daily observations." Since 1915 the temperature record has been discontinued and only the record of rainfall kept. It is, however, hoped that the Science Block, which has been recently added to the local St. Columba's College, will keep a complete record of the meteorological conditions of the town.

(a) *Temperature*—The average annual temperature is about 74½ degrees, and is below that of any other station in the plains. Roughly the day temperature in most years does not rise beyond 107 degrees F. and does not fall below 40 degrees F.

Temperature in 1874 (from Hunter's Statistical Account) —

Name of month	Highest	Lowest	Mean
January	82.2	37.5	60.6
February	89	45	64.9
March	98	52	72.1
April	101	62	85.5
May	107	70	87.7
June	97	69	78
July	91	71	78.9
August	88	70	77.9
September	89	69.5	78.9
October	87	61	74.5
November	83	49.5	66.5
December	78	40.5	60.9

Roughly the hot weather lasts for three months, from the middle of March to the middle of June, the rains the next three months, from the middle of June to the middle of September, and the cold weather the remaining six months, from the middle of September to the middle of March (the healthiest season of the year).

Reading of nocturnal grass thermometer in 1874 (from Hunter's Statistical Account) —

Name of month	Maximum	Minimum	Mean
January	49.5	23	33.9
February	54	31	41.7
March	54	37	44.7
April	61.5	45.5	54.8
May	68.5	55	62.8
June	74	74	68
July	74	68	71.1
August	73.5	67	71.5
September	72	65	70.3
October	70	53	63.5
November	64	39	47.8
December	48	32.5	39.7

It will be seen that the nights during the hottest months of the year are quite cool

(b) *Rainfall*—The average rainfall is about 52 inches. The heaviest rainfall was recorded in 1911 as 75.24 inches and the lowest in 1915 as 40.58 inches.

Rainfall in 1914 (from the District Gazetteer, Hazaribagh) —

	inches
January	0.73
February	1.32
March	0.86
April	0.54
May	1.70
June	8.04
July	12.77
August	12.80
September	8.75
October	2.63
November	0.20
December	0.18
Total	50.52

It may be noted that "though the rainfall is fair, the rain water is quickly carried away by the rivers, leaving an almost dry bed." Severe rainfall is generally associated with a severe winter and a hotter summer and better health, and *vice versa*. An east wind always hails the advent of rains. In summer, when the nights are just getting oppressive, a gentle shower falls and cools the temperature. Again in winter months, rainfall is followed by severe cold for a few days.

(c) *Humidity*—The average humidity is 51, compared with 76 in Calcutta.

(d) *Winds*—"The prevailing wind in the early part of cold weather is due west." Occasionally a north wind blows and the atmosphere becomes chilly. "About the end of February and March as well as the hot weather months of April and May, the wind becomes north-west. In the rains south-west wind prevails, occasionally it is south-east." East wind always precedes a shower.

It will be noted that, unlike Lower Bengal, there is very little south wind. A room facing north or west is very chilly in winter, and a room facing west very hot in summer. A room facing east is very pleasant in winter but very hot in summer and worst in the rains. Bed rooms and sitting rooms facing south are pleasant (though there is very little of wind from the south), provided the east and west are open.

(e) *Clouds*—The sky is, as a rule, clear, and cloudy days are few. The sunrise and sunset in a clear day, viewed from the top plateau, are extremely beautiful. In a cloudy and misty day in winter the scenery round about the lake and Gibraltar Hill is so misty and hazy, and so very beautiful, that it appears more dream-like than real. Occasionally the clouds, specially about the end of rainy season are very beautiful.

(f) *Soil*—The soil of the town is reddish in colour, consisting of clay mixed with gravel and sand, and the surface gently undulating. The rain water is quickly carried away by the natural drainage of the soil, and the gravelled roads are quite dry soon after the rains subside.

(g) *Water*—The water-supply of the town is from wells as a rule, occasionally from a tank known as *mitha talao* or sweet water tank, the water of which is softer in contrast to that of some wells in the Bazar.

Below is given the result of analysis of water of the well of St. Columba's School hostel done by my friend Prof. H. Mukerjee, of St. Columba's College —

	1000,000 parts
Total solids	23
Ammonia	Nil
Albuminoid ammonia	Nil
Chloride	0.8
Nitrite	Trace
Nitrate	Appreciable quantity
Total hardness	10

Remarks—The sample of water is not altogether colourless but very pale yellow, indicating percolation through fields. It is perfectly odourless and only slightly alkaline, as pure natural water ought to be. The solids obtained after evaporation consist partly of inorganic salts and partly of organic matter. The inorganic salts contain sodium, calcium and manganese, but no poisonous matter like copper or lead. Silica in the form of mica is also found. Organic matter appears under the microscope as vegetable cells, but muscular fibres are absent. The complete absence of ammonia and ammonia salts points to the absence of contamination from sewage. The amount of chloride found is less than that generally found in river water, as sodium and calcium chloride which are harmless.

It may be noted that on account of the absence of iron in the water there is not so much constipation as in places like Madhupore in the Sonthal Parganas. The quantity of mica present is not sufficient to cause hill diarrhoea, but though it induces flatulence, it improves the hæmoglobin of the blood (resembling the action of iron in this respect).

A simple method of removing a part of the inorganic salts of the water is to boil it and keep it in a *ghaila* or earthenware vessel for 24 hours, when some of the mica and other salts precipitate at the bottom, leaving the rest of the water quite clean.

Well water is so nice and cool in summer that ice is quite unnecessary.

V—CLIMATE

The climate of Hazaribagh is much the same as that of Ranchi, but the former is less crowded, the roads free from dust and the scenery more picturesque. The latter has all the advantages of a big town, including direct railway communication. Hazaribagh is a much

quieter place, without the bustle and activity of a big town, and thus more suitable for invalids.

The climate of Hazaribagh as well as that of Ranchi differs from the neighbouring districts of Behar in its lower average temperature and less humidity of the atmosphere even during the rains. It differs from that of Lower Bengal chiefly in the circumstance that the months of June to September are much cooler and more pleasant, the elevation of the plateau being sufficient to raise it above the effect caused in the plains by diminished radiation after rain has fallen. By the middle of September the mornings already promise the cold weather. The winter months are cold and bracing, the only drawback being the occasional excessive cold which follows a shower. The last two weeks of December and the first two weeks of January are particularly trying for Indians, as the north wind often blows at that time and the cold is piercing and there is hoar-frost at night. The intermediate months of October and February are delightful. If there is a good fall of rain in February, it remains cool till the middle of March. From April till the rains, when hot winds sometimes blow fiercely and the day temperature is high, it is rare for the night to be oppressive. The heat during the day time can be avoided by closing the doors and windows of a room and remaining inside with *punkhas* going. An oppressive hot night or two is followed by a gentle shower which cools the atmosphere.

Winter is the usual season for visitors to come here, though the summer months are even more healthy and more suitable for diabetics than the moist heat of Lower Bengal. The rainy season, as elsewhere, is the worst time of the year.

VI—PREVAILING DISEASES

(a) *Malaria*—With the clearing of the jungle when the town was made a cantonment station, malaria is at a minimum. The rain-water, as I have already stated, is quickly carried away by the natural drainage of the plateau, and there is very little accumulation of water anywhere. The older generation, who had seen the cantonment days, tell us that mosquito-curtains were quite unnecessary. With the growth of the civil station, and especially after the introduction of cess-pools, fever cases increased. One cannot do without a mosquito-curtain nowadays, except during the cold weather when all little accumulations of water dry up completely. Malaria is very rare in winter. People with malaria in their system coming here for change may get an accession of fever for a day or two, after which it ceases and they become acclimatised. Improvement then is rapid.

(b) *Paratyphoid fever*—The local people attribute its first appearance to the introduction of cess-pools. In the old cantonment days it was very rare. True typhoid cases are hardly

met with. Though the cess-pools were afterwards condemned and mostly filled up, plenty of cases of paratyphoid and malaria were found, especially in the Bazars, during the rains and before the advent of the cold weather.

(c) *Cholera*—In epidemic form it appears in the town every fifth or sixth year. "The general belief is that it is imported by returning emigrants, and often from the Jharia coal-fields. Ordinarily it makes its appearance in the hot weather and dies out after the first heavy rains of the monsoon." If at times it occurs during the end of the rains or in the beginning of winter, it becomes very serious.

We have in the "new cholera vaccine of Kasuli" a very good prophylactic which was very successful in checking an epidemic of cholera in last June, known as the "Hurburu Cholera Epidemic," a full report of which will be found in the *Indian Medical Gazette* for November last. A minor epidemic was nipped in the bud in the western part of the town in October last year by means of cholera prophylactic inoculation. It is hoped that extensive use of it will check other epidemics.

(d) *Small-pox*—Like cholera it appears in epidemic form roughly every fifth or sixth year generally at the end of winter. "In one may judge from the very small number of cases which end fatally it is often of mild type." The beneficial effect is due to vaccination.

(e) *Phthisis*—Is rather rare in the town, and found amongst the poorer classes due to ill-feeding, insanitary houses and overcrowding. Amongst certain classes of carpenters and blacksmiths it is hereditary. Of late it has been found in a few premier Bengali and Behari families living in the Bazar. The advent of more phthisis cases from outside, coming every year for climatic treatment here, will further increase the risk of infection to the local population.

(f) *Respiratory diseases* like pneumonia and bronchitis are met with during the winter months.

(g) *Digestive diseases* like dysentery and diarrhoea are found in the rains.

(h) *Other diseases*—Diphtheria, gout and rheumatism are occasionally found. Plague is unknown.

VII—DISEASES LIKELY TO BE BENEFITED

(a) *Phthisis*—Hazaribagh has a reputation as good for phthisis, and a pretty good number of cases come here for climatic treatment under medical advice. It is therefore, very desirable to discuss the advantages and limitations of this town so far as consumption is concerned.

Hale White, in his book on "General Therapeutics," points out the advantages and limitations of high altitude in phthisis as follows—

(1) "Dry air is cooling but irritating to the respiratory mucous membrane, especially if

inflamed Moist air, on the contrary, is enervating and also soothes the mucous membrane of the air-passages Moisture and warmth favour development of micro-organisms" The winter of Hazaribagh being cool and dry is irritating, and a dry hacking cough, often very persistent, is complained of by patients, especially if they suffer from extensive bronchitis of the "dry form," which often accompanies phthisis Puri and Waltair in winter would be more suitable for such cases

(2) "Pure air full of ozone is beneficial" Hazaribagh has this point in its favour if the patients avoid the Bazar

(3) Increased dryness of the atmosphere diminishes liability to bronchitis The drier atmosphere of Hazaribagh is distinctly beneficial to patients coming from Patna or Calcutta, where the atmosphere is not only "moist but warm," favouring the development of micro-organisms

(4) *Reduction of anaemia*—This is a marked feature of Hazaribagh for any person coming here in health as well as in disease The small quantity of mica in water, with the high altitude of the place, rapidly increases the hæmoglobin of the blood

(5) Patients should come during the earlier months of winter to enable them to become acclimatised before severe cold sets in The best time to come here is just after the rains by the end of September when the morning promises the cold weather People coming here from Lower Bengal in November or December get an attack of fever which ordinarily subsides in a day or two Phthisical patients should not run the risk of a febrile attack which increases the mischief in the lungs

The following contra-indications to high altitude have been noted by Hale White, and all of them are applicable to Hazaribagh—

- (1) Extensive bronchitis of the dry form
- (2) Heart disease
- (3) Albuminuria
- (4) Ulceration of larynx and intestine
- (5) Advanced cases with extensive lesions
- (6) Very old and very young persons who would best remain at home
- (7) Those liable to acute febrile attacks indicating occasional increase of mischief in lungs

To these may be added so far as Hazaribagh is concerned—

- (8) Liver disease, which is aggravated by the mica in the water
- (9) The sudden fluctuation of temperature after a shower, which induces fever in a weak person
- (10) The extreme cold of the last two weeks of December and first two weeks of January coming from the plains

Major (now Lieut-Colonel) Deare, I.M.S., in the *Indian Medical Gazette* for April, 1909,

points to the limitations of Hazaribagh as follows—

(1) "I would first note that the one season of the year when patients will derive good from the climate of Hazaribagh is the cold season—October 15th to the end of March The daily variations of temperature in the hot weather are harmful A chilly damp east wind in the rains is dangerous"

(2) "The journey of 42 miles from the railway station is very trying" Nowadays one can minimise the trouble by engaging a motor car, which takes about one and-a-half hours to cover the distance

(3) "There is the question of food supply more particularly affecting European patients The meat supply is bad, though fowl and eggs are available The bread supply is bad, fruits are not available, the milk supply is fair" The question of food supply so far as Indians are concerned, I shall discuss later on

Lieut-Colonel Deare concludes that "with these limitations one may say that Hazaribagh is suitable for consumptives in the cold weather Then with bright days, bracing air, equable temperature, patients in the early stages of the disease can come here and benefit greatly"

The late Rev Dr Hearn, of the local Dublin University Mission, in the same paper states that he attended a good many cases of phthisis amongst Indians coming from Calcutta and "Eurasians located in a temporary consumptive home, worked off as an off-shoot of the St Mary's Home, Calcutta," and he concludes that "except in hopelessly advanced cases, the results are excellent"

He compared Hazaribagh with other places good for phthisis as follows—"Puri would seem to be a better place for the treatment of Indians, who strongly object to the open air treatment in the colder months of December and January, as its temperature in winter seems less sharp and more uniform Almora is better still Puri and Waltair should get the preference The effect of climate in Hazaribagh during the greater part of the year is decidedly favourable, and it should rank high as a centre for patients from Calcutta and Patna"

Major (now Lieut-Colonel) Calvert in the same paper discusses the climate of Darjeeling in the treatment of phthisis The objections he stated are as follows—

- (1) Danger of infection to the local population
- (2) Cost of living too high
- (3) House rent very high
- (4) Overcrowding
- (5) Presence of a great deal of local phthisis
- (6) Advanced cases with extensive lesions are not much benefited

He concludes that, with these limitations, October to May is suitable, as in the rest of the year there are heavy rains and the atmosphere is damp and the sky misty

It may be noted here that Puri is a place of pilgrimage, and at the times the pilgrims visit it cholera epidemics are quite common, endangering the health of the local and floating population. The danger of infection to the local and floating population, on the other hand, is increased with the advent of a large number of phthisis cases at Puri. Waltair has the advantage of hill and sea, but, like Almora, is too far off from Calcutta or Patna. Darjeeling is too expensive. Ranchi is too crowded. Hazaribagh is much quieter and, barring the limitations already discussed, is very good in the cold weather months. The improvement in the winter months is marked, in summer the condition of the patient is stationary, whereas in the rainy season the movement is retrograde.

(b) *Anaemia* due to any cause is much benefited here. As has been already noted, the small quantity of mica in the water is not sufficient to cause hill diarrhoea but causes flatulence, which is one of the commonest complaints of the local Indian population, probably in part due to their farinaceous diet and sedentary habits, for Europeans never complain of it. Mica, on the other hand, as has been noted long ago by Ayurvedic physicians, increases the hæmoglobin of the blood and rapidly removes the *anæmia*.

(c) *Convalescence* after malaria, influenza, beri-beri, and epidemic dropsy is accelerated, unless there is associated indigestion and constipation, when the improvement is slow, or associated organic diseases of the heart or kidney, when very little beneficial effect is noticed.

(d) *Insomnia and neurasthenia* are much benefited by the change of scene and surroundings, the picturesqueness of the place and the coolness of the atmosphere bringing ready relief.

(f) *Diabetes*—The coolness of the atmosphere at night during the hot weather is of great advantage.

(g) *Liver cases*—For persons suffering from sluggish liver with its associated indigestion, flatulence and constipation, Hazaribagh is no good, unless they take a preliminary course of water treatment on the river Sone, in places like Koilwar on the Chord Line, or Dehri on the Grand Chord Line, E. I. Railway, or Chunar on the Ganges in the U. P. The rivers mentioned at the above three places contain lime, flowing from the neighbouring lime hills, and the water checks acidity, removes constipation and improves torpidity of the liver. A stay of a month or so, according to the needs of the patient, followed by a change at Hazaribagh, is very beneficial to such patients.

VIII—OTHER INFORMATION

(a) *For invalids*—The distance of Hazaribagh from the railway station—42 miles—is

covered by motor service lorries in three or four hours, and in touring cars, available by previous intimation, in one and-a-half or two hours. The road passes through one of the most picturesque parts of the district.

On foodstuff, etc., for Indians—Fine rice is rare, very good *atta* and *maida* (flour) are not readily available (though hand-ground *atta* can be easily obtained), fish is a luxury here, and good fish like *rohu* can be had occasionally, coming from a distance of 20–30 miles from the town. Vegetables are plenty and cheap in the winter months, good milk and ghee are available as also fowl and eggs, though the price is daily going up. Servants are not available. House accommodation is limited, and generally houses are unfurnished. Ordinary bedstead, tables and chairs are available on hire to a limited extent.

(b) *For sportsmen*—Of big game, tiger, leopard and bear are to be found in various parts of the district. Hyenas, wolves, foxes and jackals are quite common. Besides these, pig, hare, the various kinds of deer, sambhar, spotted deer, hog deer, four-horned deer, ravine deer and migu, are also found in the jungle.

Of game birds may be mentioned the peafowl, grey partridge, jungle fowl, spur fowl, field quail, bush quail, green pigeon, sand grouse, snipe, golden plover and, occasionally, geese and duck.

(c) *For sightseers*—The district is full of picturesque scenery. The following are mentioned as either places of particular interest or more or less situated on the road-side.

(i) The "Hudru Fall" is caused by the Subarnarekha river "rushing down a rocky chasm 320 feet, which, however, does not form a sheer drop except in the rains." It is situated on the south-east portion of the district, the river marking at that part the boundary between this district and Ranchi. It is a long way off from this town and is more easily approachable from Ranchi, the distance being much shorter.

(ii) The "Karanpura Valley" on the Tandwa-Barkagaon Road, a second class District Board road from the town towards the south, on the tenth mile from the town, begins the descent to the valley. From that spot the valley appears as the surface of a pictured landscape with a silver thread—the river winding its way across the valley, and on the background rises the "Mahudi Hills" with its Buddhist caves. In the valley are small villages with huts appearing no bigger than toy huts, interspersed with tall green palms appearing as small as garden palms.

(iii) The temple of the goddess "Chinnamasta," at the junction of the river Bhera with the Damodar, is about 45 miles from the town. The isolated situation of the temple, the

beautiful gorges of the Damodar river, and the general picturesqueness of the surroundings more than repay the trouble of the journey

(iv) The "Chutupalu Hills" on the Hazaribagh-Ranchi road marking the boundary of the two districts on the south. The road winds along the side of the hill and the scenery is exceedingly beautiful—in miniature like the scenery from Siliguri to Darjeeling

(v) The "Parashnath Hill" is too well known and needs no description here

(vi) The "Suraj Kundu Hot Springs" are situated on the Grand Trunk Road at mile 229. Dr. Hooker, in *The Himalayan Journal*, gives the following description—"The Hot Springs are situated close to the road, near the mouth of a valley, in a remarkably pretty spot. They are, of course, objects of worship. The hot springs are four in number and rise in as many ruined brick tanks about two yards across. Another tank fed by a cold stream flows between two of the hot, only two or three paces distant from one of the latter on either hand. All burst through the gneiss rocks, meet in one stream after a few yards and are conducted by bricked canals to a pool of cold water about 80 yards off. The temperature of the hot springs are, respectively, 169 degrees, 179 degrees, 190 degrees, of the cold 84 degrees to 75 degrees. The hottest is the middle of the five. The water of the cold spring is sweet but not good, and emits gaseous bubbles. Of the four hot springs, the most copious is about 3 feet deep, bubbles constantly, boils eggs and, though brilliantly clear, has an exceedingly nauseous taste. This and the other warm ones cover the bricks and the surrounding rocks with a thick incrustation of salt." The water of the springs is sulphurous. Local people bathe in the water of the spring, collected in a bathing tank erected close by, for the cure of various skin diseases.

Well-wooded striking hills and forest-clad valleys are found all over the district and are too numerous to mention

IX—FUTURE POSSIBILITIES FROM A MEDICAL POINT OF VIEW

(a) A sanitarium for phthisis for Indians near the "Gibraltar Hill" in the town. A syndicate, with a capital of three to four lakhs of rupees, could easily and successfully run it. The spot is ideal and picturesque, with the hill on the back ground, a salwood jungle close by, and a small stream trickling round the base of the hill. Except Mr. Mallick's house, no house is close by, the nearest house being about half a mile distant, and the Bazar a little over a mile. The danger of infection to the local population would be minimised if a number of cottage wards were built with a central hospital containing a few paying beds. The cottage

wards would attract numbers of the phthisis patients coming here for climatic treatment. The danger of infection to the local population would thus be minimised. A big compound can be acquired at a low price, as plenty of land is available. A small dairy farm with poultry breeding facilities would add to the comfort of the patient by supplying good milk, meat and eggs.

(b) A mineral "spa" at Surajkundu—a more ambitious and expensive enterprise

X—CONCLUSION

The salubrity of the climate, the pleasing scenery of the surroundings, the presence of game, big and small, in the jungles and the facility of journey by motor attract a good number of Europeans and Indians as visitors to this pretty little town every year in winter. For Indians coming here to recruit their health, it is always advisable to avoid the Bazar. One notices on an evening drive, as one leaves the Bazar, the freshness and coolness of the atmosphere, devoid of dust and smoke, while the beautiful scenery all round is refreshing to the body and the mind. The best time for invalids to come here to recruit their health is after the rains, when the cold weather sets in, by the end of September, so that they can get enough time to acclimatise before the severe cold sets in.

LIST OF REFERENCES

- (i) Hunter's Statistical Account of Bengal (District Hazaribagh)
- (ii) The *District Gazetteer*, Hazaribagh
- (iii) Hale White's Text-book of General Therapeutics
- (iv) *The Indian Medical Gazette*, April, 1909

A Mirror of Hospital Practice

A CASE OF PENETRATING ABDOMINAL WOUND

By DR S N MISRA,

Civil Surgeon, Jalau

A MAN named Karonja, aged 70, was admitted in this hospital on 28th May, 1920, for treatment of penetrating wound of the abdomen. The man was gored by the horn of a bullock the day before. The wound was about two inches long, and situated parallel to, and an inch and-a-half above, the right Poupart's ligament. The small intestines were protruding and adherent to the wound. The exposed surface did not look like intestine. There was no vomiting, but the bowels were constipated. The temperature on admission was 100.2 degrees F, and it never rose beyond 101 degrees F.

The patient was perfectly conscious all through. The wound was thoroughly washed with normal saline solution, the adhesions were separated very gently and the bowels, which were found to be congested, could not be put back into the abdominal cavity. On enlarging the wound the rent in the anterior abdominal wall was found about two inches above the skin wound. The subcutaneous rent in the abdominal wall was cleaned with normal saline solution and the bowels were reduced, and it was sutured interruptedly by silkworm gut, and the skin wound by continuous horse hair sutures. The wound was dried and dressed antiseptically. For the first three days he was given nothing but warm water to drink, then he was put on liquid diet, and gradually solid food was permitted. He passed flatus all along after the operation, and on the fifth day a glycerine enema was given, when, assisted by the introduction of the finger into the rectum, large hard scybulous masses came out. Later he complained of distension of the bowels again and was given castor oil mixture, and this did him a lot of good. The patient had no complications and the stitches

- 3 Avoidance of strong antiseptics
- 4 Avoidance of food for three complete days
- 5 Absolute rest in the bed
- 6 Use of warm water to quench the thirst

REPORT ON A LARGE LIPOMA IN A CHILD

By J. C. TULL, M.D., M.R.C.P. (London),

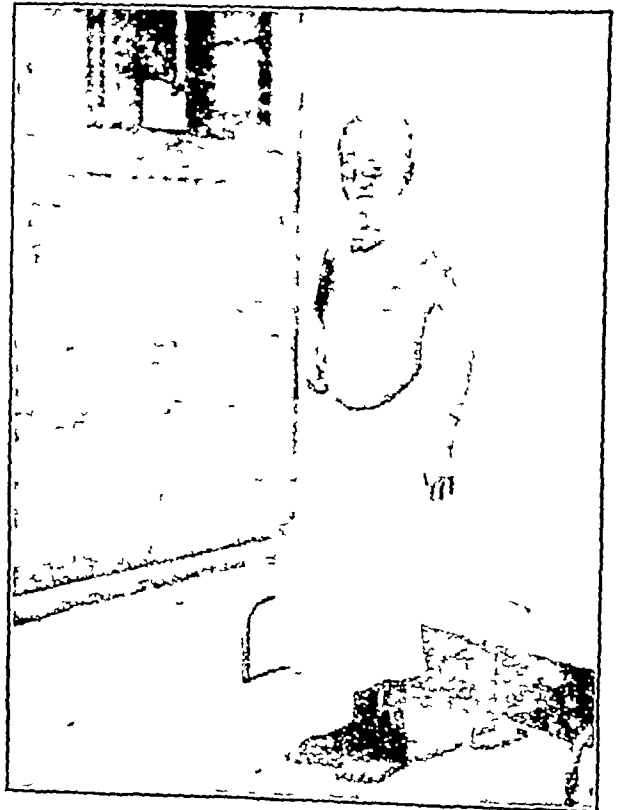
AND

MAQBUL ALAM, L.M.P.,

1st Grade Sub-Assistant Surgeon

The following case came under our observation in the Syriam Municipal Hospital, Burma, during the month of April, 1920, and is considered of sufficient interest to deserve reporting.

The child is 11 years old, a native of Gangaum, India, and came to Burma to the Syriam Municipal Hospital for operation because his brother had been operated on in this hospital in 1918.



were removed on the tenth day, and some stitch ulcers were left to heal. He left the hospital without permission one night.

The special points in the above case are —

- 1 Age of the patient
- 2 The extent of the injury

His personal and family history are negative. There are no signs of congenital syphilis.

History of present illness—Began in 1917, when a small tumour was noticed in the left breast, in the neighbourhood of the nipple. It grew slowly, and by the end of a year was the

size of a large orange. At this time he first sought treatment, and was given an ointment by an Uriya physician. An ulcer resulted on the portion of the tumour farthest from the body, with some slight bleeding. This ulcer has never healed, nor did the medication arrest the growth of the tumour, which grew steadily up to the time of admission to this hospital.

There was no pain at any time, and the only inconvenience was a mechanical one in using his left arm, due to the size and location of the tumour.

Condition on admission—A poorly nourished child of 11 years. Unable to bring left arm to side completely, because of obstruction by the tumour.

Weight 51 lb. There is slight atrophy of the left pectoral muscles. Teeth, mouth, pharynx, heart, lungs, and abdomen negative. There is no general nor local glandular enlargement. Liver and spleen not enlarged.

Urine. Negative.

Blood. Hæmoglobin 60 per cent. A stained film shows no abnormality. No leucocytosis. Over the left chest, extending from the left border of the sternum to the axilla, and from the left clavicle above to the 7th rib in the axilla below, there is a hemispherical tumour measuring 25 inches in circumference at the base. It is freely movable, and not adherent to the deep tissues over the chest wall. There is no fluctuation, and no nodules are palpable.

The nipple is stretched and not puckered. Just outside the nipple is a circular ulcerated area, 4 inches in diameter, with a clean base, in which there is distinct granulation. The edges of ulcer are clean, and not undermined. It seems likely that the ulceration is the result of slight injury, with poor vascular supply, although the superficial veins over the tumour are prominent. The tumour is evidently a lipoma.

On April 22, 1920, under chloroform, the tumour was excised. Two elliptical incisions were made and a huge lipoma shelled out. There was considerable bleeding from deep vessels, going into the tumour from the chest wall, but nowhere were there any dense adhesions. On removal the tumour weighed 8 lb. Sections showed a multilobular lipoma, with no evidence of malignant disease. The ulcer was not tuberculous.

The child made an uninterrupted recovery, and one month later was discharged from hospital quite well with free use of his left arm, and weighing 52 lb., so that he gained 9 lb. in a month from the removal of the tumour.

The case is considered of unusual interest for the following reasons—

- 1 The large size of tumour
- 2 Its occurrence in a young male child
- 3 The abundant vascular supply in a simple lipoma.

4 The rapid gain in weight after removal of a benign tumour.

Photographs of the child on admission, and a month after removal of the tumour, are attached.

NOTICE.

CALCUTTA SCHOOL OF TROPICAL MEDICINE

THE DARBHANGA MEDICAL RESEARCH SCHOLARSHIP

THE Darbhanga Medical Research Scholarship at the Calcutta School of Tropical Medicine has been endowed by His Highness the Maharajah Bahadur of Darbhanga. The scholarship is of the value of Rs 200 p m, and will ordinarily be held for three years under the following conditions—

(1) The holder shall be a pure native of India, holding a medical qualification registrable under any Indian Provincial Medical Council. Assistant and Sub-Assistant Surgeons in Government service shall also be eligible.

(2) The scholarship shall be tenable at the Calcutta School of Tropical Medicine, where the research scholar shall ordinarily work.

(3) Candidates will be required to produce evidence of previous laboratory and scientific training and of proficiency in or aptitude for research work.

(4) The holder of the scholarship shall work for not less than five hours daily during week days solely at research work during fixed hours in the laboratory.

(5) The holder shall be appointed by the Governing Body of the Endowment Fund of the Calcutta School of Tropical Medicine. He will be required to submit an annual written report on the work done, or as called upon to do so.

(6) The scholarship shall ordinarily be tenable for three years, but may be discontinued by the Governing Body at any time if they consider that the holder is not doing satisfactory work. It shall also be open to the Governing Body to extend the term of tenure to a longer period than three years.

(7) In the event of an Assistant Surgeon or Sub-Assistant Surgeon being appointed it is hoped that the Provincial Government concerned will grant the necessary leave on deputation, and will also pay the candidate's grade pay in addition to his receiving the scholarship of Rs 200 p m.

(8) The subject for investigation in the first instance shall be the methods of prevention and cure of filariasis, elephantiasis and allied conditions.

(9) Applications should reach the Secretary, Calcutta School of Tropical Medicine, Calcutta, before 15th November, 1920, and be supported by true copies of original testimonials, etc.

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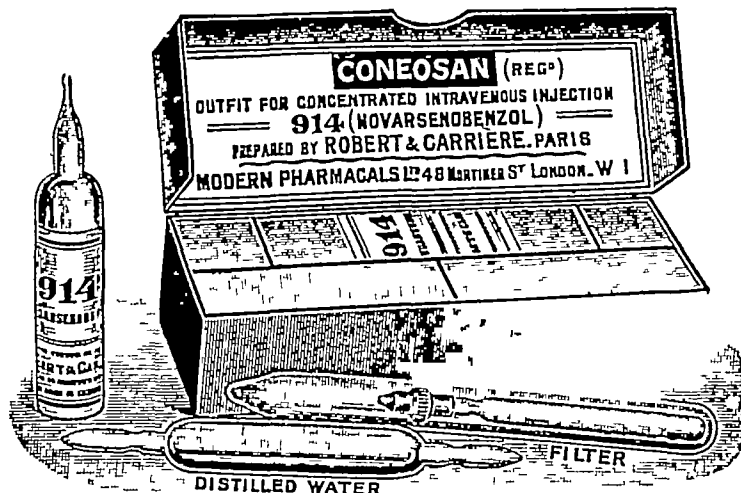
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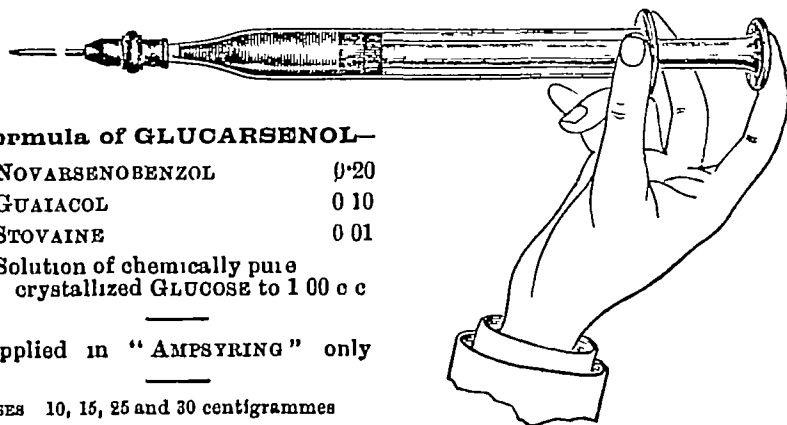
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Indian Medical Gazette.

AUGUST

ELECTRICITY AND MEDICINE

THAT electrotherapy is fast coming into its own no reader of current medical literature will deny. There is still, however, a feeling among the older type of practising Physician and Surgeon that electrotherapeutics savours strongly of the charlatan. This feeling in the past was fostered by the fact that electrical treatment was largely in the hands of quacks, charlatans, or poorly qualified medical men who had failed in other walks of medical life. Thanks largely to the great war there is no longer any justification for such a feeling. Electrotherapy has passed through the fire, and has come out purified and free from reproach. Nevertheless it is still frequently the experience of the electrotherapist to have cases sent to him for the administration of "sparks," "violet rays," or the like, by the Physician or Surgeon who is not *au fait* with the latest advances in this interesting branch of Medical Science. While one type of Physician errs in the employment of popular and unscientific names, thereby displaying his complete ignorance of the subject, another will send his patient with minute directions as to the kind of treatment required, dosage, etc.,—"five minutes' High Frequency daily" or "ten minutes' galvanism on alternate days"—forgetting that the electrotherapist is a qualified man who ought to be consulted as a specialist, and who should be allowed to choose the form of electrical treatment, the method of application and dosage. It is the business of the electrotherapist to know the appropriate treatment for different diseases. It is his duty to regulate the dosage according to the needs of the patient. But this is not all, there is still another type of practitioner, the one who leaves his electrotherapy in the hands of a nurse or masseuse, who often has but a mere smattering of Anatomy, Physiology, and Electricity, and knows nothing at all of Medicine and Surgery. It is thus that electricity as a form of medical treatment has become discredited in the past.

Such was the state of things generally before the war, and such still is the state of things in the backwaters of our profession. It is therefore gratifying to read in a current number of the Archives of Radiology and Electrotherapy

that "The London Course of Study in preparation for the examination next summer at Cambridge, for the Diploma in Medical Radiology and Electrology, has now commenced. Clinical instruction of intending candidates is proceeding at various hospitals and lectures on Electrotherapeutics and Physics are in progress." The inauguration of this course, with which we may connect the names of Dr Barclay, Dr Robert Knox, Dr Cumberbatch, Dr Sidney Russ, Dr Shillington Scales, and others, marks the beginning of a new era in the history of Electrotherapeutics, and will do much to raise this branch of Medical Science to its proper place.

The first lecture of the course, "The History of Electrotherapy," was delivered on February 4th at the House of the Royal Society of Medicine by Dr Turrell, Physician to the electrical department of the Radcliffe Infirmary, Oxford. In the course of the lecture, Dr Turrell showed that the foundation of the Science of Electricity was laid by a medical man—Dr Gilbert of Colchester—at the beginning of the 17th century. The first recorded account of the application of electricity to medical purposes is that of Kratzenstein, Professor of Medicine at Halle, who, in the year 1749, "cured a woman of a contracted finger in a quarter of an hour." Thereafter the subject was developed chiefly by French workers.

In England electrical treatment was first practised by the clerical profession—notably Lovett, a lay clerk at Worcester Cathedral and John Wesley, the great divine. The first treatise on electrical treatment written in England by a medical man was that by J. Smith Carmichael in 1764. This was followed in 1778 by a thesis by Dr Robert Stevenson of Edinburgh, entitled "De Electricitate et Operatione ejus in Morbis Curandis," really a resume of the work of earlier writers.

Further steps in the history of the progress of Electrotherapeutics are marked by Galvani's discovery of animal electricity, Volta's Voltaic pile, and the discovery of the induction coil by Faraday in 1831.

The lecturer then brings us to more recent times, mentioning the establishment of the first electrical department in England at Guy's Hospital under the care of Dr Golding Bird in 1836, from which date electrotherapy took its place as a recognised and distinct branch of Medical Science.

Dr Turrell ascribes the undulating character of the progress of electrotherapeutics to "the immediate exploitation of any new discovery by unqualified and unprincipled quacks"

In his concluding remarks he very rightly says "It is manifestly absurd to suppose that such a highly specialised science and art as electrotherapy, comprising as it does, or at any rate should do, an intimate knowledge of Anatomy, Physiology, Electricity, and Pathology, can be practised by any electrician or masseuse"

We may therefore hope that the new generation of medical men will have a better sense of perspective where electrotherapy is concerned than the old, that in the future there will be less scope for the operations of electrical quacks and charlatans, and lastly, that progress in the most fascinating of all the branches of Medical Science will be rapid and continuous

Current Topics.

Radiography in Hepatic Conditions: A Valuable Aid to Diagnosis

WHEN we have to consider the diagnosis of conditions apparently centred in the right side of the upper abdomen, there are so many structures possibly concerned and so many perplexing symptoms may arise that, whatever degree of clinical expertness the observer may be able to claim, there is no doubt that any accessory method of examination likely to aid in the differential diagnosis is well worth any trouble which its careful execution may involve. In this connection radiography has long ago established its potential value, but in recent times not only knowledge, but also technique and apparatus, have so greatly improved that a good, clear summary of the present position serves an obviously useful purpose, and one is glad to be able to point to a publication providing those details in the volume on "Radiography in the Examination of the Liver, Gall Bladder, and Bile Ducts," by Dr Robert Knox, radiologist to King's College Hospital. Written primarily for the radiologist's reading, this particularly descriptive work should also be of considerable use to the physician in bringing before him both the possible aid to be derived in difficult cases from radiographic information and also the standard of x-ray evidence he can now rightly expect to receive.

GALL STONES

The exact cause and origin of gall stones need not concern us here, but their classification, according to Adams, is important. The types are (1) almost pure cholesterol (very rare), generally single, with a minimum amount of calcium present, (2) laminated cholesterol (also rare), solitary, often of large size, differing from Group 1 in containing a higher calcium percentage, (3) common gall stones, single or numerous, of dark-red colour, with a nucleus and concentric layers, containing cholesterol, bilirubin-calcium, and small quantities of copper and iron, (4) pure bilirubin-calcium, often occurring as bile gravel and consisting almost entirely of calcium salts, (5) pure calcium carbonate (these are generally very small and very dense). Thus it is seen that, fortunately, the great

majority of stones have a certain amount of calcium salt in their composition, and this substance gives, bulk for bulk, an x-ray shadow practically equivalent to that of bone. The shadow may be simply a ring, stippled or broken, but the great point made is that a negative diagnosis cannot be assumed unless rays of varying penetration have been used. In an experimental contrast the author explains, "the less penetrating rays with a long exposure gave negatives richer in contrast and full of detail, the very penetrating rays gave negatives with less contrast but good detail in all parts, the moderately penetrating rays gave thin negatives, largely because the exposure was much under that necessary to blacken the plate, longer exposures gave greater contrast." And here lies a difficulty, since in the living subject with breathing movements a long exposure is inevitably followed by blurring of shadow edges, the sharpness of which is essential to appreciating with certainty the presence of a gall stone.

REDUCTION OF EXPOSURE

The technical methods of obtaining a reduction in exposure time are beyond the scope of this note, but they are nowadays readily workable, and as Dr Knox describes them with great clearness, let us simply note that in all radiographic examination for gall stones it should be the routine practice to expose several plates to the radiation of tubes of different penetrating power, and in each case to develop the plate to give the maximum of contrast. To the expert this abstract advice may appear sadly lacking in detail, but for the physician's reading, to carry the point one stage further, the results of the author's own experiments are best quoted, for they dispose of at least one fallacy, and do much towards fixing a principle upon which routine work should be demanded.

THE ACTION OF HARD RAYS

"The tissues absorb a large percentage of the 'softer rays,' and the rays which give detail in the organs, and even in gall stones, are rays of 'medium hardness,' and it is a fallacy to depend upon getting detail in substances which are not very opaque with a soft tube when these structures are in the interior of the body. A hard tube, if the right exposure be given, will show a shadow of the object, hard rays do not entirely pass through gall stones, as was formerly taught. When so-called soft rays are used the tissues of the body act as a filter, and absorb practically all these soft radiations, the rays which act upon the plate in the radiography of gall stones are the medium and hard rays. Prolongation of the exposure will certainly give denser and more fully exposed radiograms, but that takes place only because a larger percentage of the medium and hard rays get through the tissues, and so act on the emulsion of the plate. Prolonged exposure with 'soft rays,' so long as they do not possess the property of penetrating the tissues, will not give denser plates, the rays will be absorbed by the tissues for an indefinite time." The emanation from a "soft tube" may, and usually does, contain a percentage of "medium" rays, and so, by lengthening the time of their action, sufficient exposure may occur on the plate, but the conclusion arrived at is that the desired combination of a short but efficient exposure is only to be gained by the use of the *moderately hard* rays, and that calculation must be guided by the concentration of those available.

STEREOSCOPIC WORK.

Having touched upon it even thus vaguely, the physical side of the question must be left with a reference to the possibilities which lie behind stereoscopic radiography and stereoscopic screening as applied to these cases. They come among many important powers in differential diagnosis which are possessed in radiographic methods. Differentiation of gall stone shadows from those of renal calculi is always difficult, and, as a critic, one would say from the literature well-nigh impossible by a single plate alone, but, as Dr Knox points out, definitely to settle this point plates should

be exposed in three positions—(1) dorso-ventral (2) ventro-dorsal, and (3) lateral or lateral oblique. When the plate is on the anterior surface gall stone shadows will be smaller than when it is placed dorsally, and with a lateral view it is very frequently possible to give a definite decision as to whether a stone is in the kidney, gall bladder, or bile ducts. One of the many excellent features of the volume under notice are the extremely clear reproductions in illustration of this point.

RADIOGRAPHIC FALLACIES

Calcified mesenteric glands form a radiographical difficulty apparently more common than might be supposed. Their wandering habits as the intestinal movements occur may serve to differentiate them, but again the problem calls for more than one simple examination. Many more queer fallacies are given, such as calcified areas in the liver, foreign bodies, irregularly ossified costal cartilages and late inflammatory changes with calcification in adjoining structures. Of the greatest interest to the expert, they also give graphic demonstration of the need for extreme care in the drawing of conclusions.

THE PATHOLOGICAL GALL BLADDER.

It may still harbour the conviction that it is only the calculus or pseudo calculus condition which can be detected by r-rays then we would refer them to the author's description and remarkably convincing plates of primary cholecystitis and conditions secondary to it.

The gall bladder may be shown to be distended with fluid a faint globular shadow situated beneath the liver is occasionally seen in examination of cases in which gall bladder trouble is suspected. In exceptional cases a normal gall bladder, if distended with bile may be shown. The future diagnosis is full of promise if the investigator realises that it is possible to get very fine detail on the plates and if he is prepared to devote a great amount of attention to the technique."

ILLUSTRATIONS.

And indeed, the illustrations which the author provides form ample justification for his prediction. Apart, however from a sound explanation and thoroughly interesting discourse upon the subject, Dr Knox has provided in his concluding pages a remarkably complete set of historical notes and abstracts from the literature of the radiography of the anatomical parts in question and has besides himself adding in his own experimental section a most valuable contribution to radiological advance, given to the profession a concise account of a matter of considerable interest to both the consultant and general physicians of the time—*The Hospital*

Some Problems of the Circulation during Gas Poisoning

Journal of the Royal Army Medical Corps
No 2, Vol XXIV February 1920—JOSEPH BARCROFT, C B E, F R S

In a lecture delivered at the Royal Army Medical College Mr Barcroft discusses "that part of the pathology of poisoning with pulmonary irritants which concerns itself primarily with the circulation as evidenced by experiments carried out on animals in the Physiological laboratories of the Royal Engineers' Experimental Ground at Porton."

Discussing the pathology of gassing, the lecturer pointed out that the severity of the affection depends on the dose of gas. Taking as an illustration an animal (goat) where the degree of gassing is near the fatal limit, he emphasised the fact that the whole lung is affected but not equally so. The lung is red, the cardinal feature at first being damage to the blood

capillaries where they are exposed to the gas, viz beneath the alveolar epithelium.

The damage to the capillaries may be of two degrees, viz—

(a) Intra-capillary thrombosis with complete stoppage of circulation

(b) Increased permeability of the walls leading to oedema

The second stage sets in after the fourth hour, in it the oedema rapidly increases until the lungs may weigh four to six times the normal.

By means of diagrams the lecturer showed that if blood circulated freely through the oedematous portions of the lungs, the badly aerated blood from such portions would mix with good blood from the unaffected portions, vitiating the quality of the blood supplied to the left ventricle. Slides were exhibited, however, which showed that the capillaries in the completely oedematous portions of the lung are empty and cannot be injected. Blood does not therefore circulate through the completely oedematous portions, and the quality of the blood is maintained.

When the third stage of gas poisoning, viz, resolution, is entered on (about 24 hours after gassing) the two parts become completely differentiated and the question now arises—How is the animal protected from the effects of the decreased quantity of blood which must be delivered to the left auricle when a large proportion of the capillaries are cut off? There are two ways in which the "minute volume" (the No of cc delivered to the left auricle per minute) may be maintained—

- 1 By a rise of pressure in the pulmonary artery
- 2 By dilatation of the pulmonary capillaries

The former was investigated first. In an artificial model of the circulation, cutting out half the circulation caused an immediate increase in the arterial pressure, a fall in the minute volume, and a rise in the amount of work done by the pump. Starling and Fuhner had previously recorded similar results in the case of the heart-lung preparation after constriction of the pulmonary vessels by injecting adrenalin. By means of a needle in the right ventricle the lecturer was unable to demonstrate a similar rise of systolic pressure in a gassed goat when differentiation of the lungs must have been complete. In some cases there was a preliminary rise which soon disappeared. We have therefore to turn to the second possibility, viz, a reflex dilatation of the pulmonary arterioles. That such a mechanism is not active in the heart-lung preparation proves that it must be under control of the nervous system. Indeed, the above quoted experiments of Fuhner and Starling, and evidence brought forward by Mrs Tribe, prove the presence of vaso-motor nerves in the lung. "It would seem then that the pulmonary circulation closely resembles the systemic, that just as the pressure in the systemic

arterial system is controlled by the depressor nerve, so also there must be a similar reflex from the right heart which controls the calibre of the vessels in the lung and so maintains a fairly constant pressure in the pulmonary artery. Some evidence of the path of this reflex mechanism has been furnished by Schafer. It is being pursued further in the Cambridge Laboratory at present."

As regards the mechanism by which the closure of the capillaries in the hepatized lung is brought about, the lecturer mentions four possibilities —

- 1 Thrombosis of a fibrinous nature
- 2 Congestion and thrombosis with R B C
- 3 Vaso-constriction
- 4 Pressure of œdematous fluid on the capillary walls

The last explanation was the one finally adopted, thrombosis has been excluded definitely, but there is some doubt as to how far, if at all, vaso-motor influences are responsible.

The lecturer in his concluding remarks expressed the opinion that the above applies not only to broncho-pneumonia caused by phosgene or chloropicrin, but to broncho-pneumonia from any other cause.

The Treatment of Sea-Sickness: A New Method and its Theory

THE means by which the sufferings of the landsman afloat can be relieved form a subject which has received, for ages past, so much professional and quack attention that it seems almost impossible that a new and simple treatment upon rational lines could be invented.

A short time ago, however, certain writers of the French school put forward, and, indeed, claim success for, the atropine-adrenalin method. The resumption on a large scale of ocean passenger traffic, the likelihood of an increasing number of people being faced with the problem of keeping reasonable comfort of body during many weeks at sea, and correspondingly increasing their demands for medical advice upon the subject, make it worth while at least considering the possibilities of the new suggestions.

We may confine ourselves here to a brief outline of the principle, and as the actual treatment is absolutely simple in technique, the result must depend largely upon the judgment with which the drugs and their exact doses are administered. The point made is that sea-sickness must be restudied from the standards set up for endocrinology and the pathology of the sympathetic nervous system. It is stated that during the typical state of nausea, headache, etc., the arterial tension is progressively increased up to a certain point and then falls steadily as the malaise continues. In an attempt to attribute the changes to causes other than nervous abnormalities a series of lumbar punctures and blood counts were performed, but no consistent results were obtained and nothing to suggest that the pathology would be elucidated by such means.

Clinically, however, there were definite signs of a state of hyper-excitability of the sympathetic system recorded by one set of observers, while, on the other hand, another set found exactly the reverse condition, namely, a vagotonia to be present. More recently the two views are reconciled by the announcement that, at the onset of symptoms, first the sympathetic system is at an abnormally high tone, and later, as the days of illness continue, this falls and is finally reversed, the vagus system then having the upper hand in the balance. If we care to theorise on the point, it may be that the

initial sympathetic or adrenal activity causes a gradual exhaustion of the cells in the adrenal cortex, and so, after a short time, vagus effects and predominance come more and more to fill the picture. In any case, the French observations would seem to suggest that sea-sickness has its pathology based upon the relative activity of the adrenal cells, and therefore upon the tone of the sympathetic system.

Thus we come to the interesting question of which persons are and which are not predisposed to *mal de mer*. It will be generally agreed that those who exhibited a highly-strung, sympathetic system are generally the more susceptible, while the converse is also true. A case in point is the relative immunity enjoyed by the very young child, in whom the vagus system is invariably the more important for the time being. Also, true vomiting crises—vagotonic paroxysms—are more frequently met with in protracted cases of illness where the gradual exhaustion of the adrenal element has previously occurred.

So much for the theory, and, if we view this as a possible pathology for the condition, then treatment along certain lines is an obvious deduction. If the sympathetic tone is up, administration of adrenalin would obviously aggravate it, but if it has fallen, as it will have in the majority of severe cases coming under the doctor's notice, then adrenalin will act as a valuable antidote to the vagus predominance. Otherwise, for severe vomiting and other critical vagus manifestations we can use the simple atropine injections.

Thus the first point to be decided is apparently the stage of the process encountered, and although there does not at first sight seem to be more in this treatment than a theory and a rational control for the later stages of acute sea-sickness, yet the whole matter is viewed in an entirely new and simple light, and under those conditions is well worthy of passing attention.—*The Hospital*

Fatigue Curves as a Method of estimating Nerve Energy.

Journal of the Royal Army Medical Corps
No 2 Vol XXIV, 1920—MAJOR T W
GORDON KELLY

In an interesting paper Major Kelly gives results of observations with Mosso's Ergograph in five cases convalescent from acute diseases. The tracings all show marked improvement in the power to perform muscular work, and hence Major Kelly argues a gain in nerve energy. The only medicine given was casein-sodium-glycero-phosphate in the form of Sanatogen.

Discussing the value of Sanatogen as a nerve food, the writer mentions metabolism experiments carried out by Tunncliffe, which showed a marked increase in the retention of phosphorus as well as nitrogen in the body after the administration of casein-sodium-glycerophosphate. Mann subsequently demonstrated, by microscopic examination of the nerve cells of frogs, visible indications of heightened vitality in the ependyma cells of the central canal of the spinal cord and in the small nerve cells of the mid-brain after feeding with the same substance. If we assume with the writer that the ultimate criterion of increased nerve energy lies in the patient's power to expend energy in the form of muscular power, and further that the improvement noticed was *propter hoc* and not *post hoc*, then, Major Kelly adduces very strong

evidence in favour of Sanatogen as a nerve food

Transfusion of Blood in Pernicious Anæmia

Edinburgh Medical Journal Vol XXIV No 5
May 1920—J. M. GRAHAM, F.R.C.S.

In this paper the writer analyses the results obtained in a series of twenty-three cases of pernicious anæmia treated by transfusion. Of the twenty-three, nine were males and fourteen were females. Nineteen received only one transfusion, three received two and one received three transfusions.

Direct transfusion from artery to vein was performed in nineteen cases, and indirect transfusion from vein to vein in seven cases. Citrated blood was used on two occasions.

The conclusions reached are as follows—

1 Transfusion of blood is of considerable value in cases of pernicious anæmia which have failed to respond to all the usual medical measures. It may alleviate, but cannot cure, such cases.

2 The ideal method of transfusion is either direct from artery to vein, or, preferably, indirect transfusion from vein to vein. Anticoagulant substances should not be used when methods of transfusing unmodified blood are available.

3 A large amount of blood is unnecessary, owing to the risks of over-transfusion and to the fact that the benefit conferred by transfusion is not necessarily in proportion to the volume of blood received.

4 A repetition of transfusion should be considered when the symptoms relapse, or if the first transfusion fails to produce the desired effect.

5 The dangers associated with transfusion are small when the modern technique for transfusion is used, and especially if preliminary tests have been made to exclude the risks of hæmolytic.

6 Transfusion is not to be regarded as an alternative to other forms of treatment, but as a therapeutic agent in reserve, available when the usual measures have failed.

7 The benefit resulting from transfusion may be only slight and temporary, or it may be continuous and a fresh period of remission from the anæmia may be initiated.

8 The prospects of benefit are greater if the transfusion is not postponed till the patient is critically ill and in immediate danger of dying.

9 Even in apparently exhausted cases, regarded as hopeless, and whose death appears to be imminent, transfusion occasionally will resuscitate the patient in a remarkable manner.

10 Transfusion will initiate a fresh remission in 43.4 per cent of cases in which the anæmia has been progressive or has failed to respond to medical treatment, including arsenic.

11 When the patients are critically ill at the time of transfusion, having failed to respond to

treatment including arsenic, a fresh remission follows in 28.5 per cent of the cases.

12 When the patients are seriously, but not critically, ill at the time of the transfusion, having failed to respond to treatment including arsenic, a fresh remission follows in 50 per cent of the cases.

13 The results of transfusion are always uncertain in any given case.

14 Cases of an acute type, and cases with marked pyrexia or a history of hæmorrhages, are least likely to benefit.

15 The immediate effects of transfusion are often striking. Signs of improvement are noted in the colour, mental alertness, pulse, blood pressure, and in the appetite. The patient frequently feels better and stronger.

16 Symptoms of nausea and vomiting are occasionally almost at once relieved and the patient is better able to take nourishment.

17 Arsenic occasionally is better tolerated and frequently is more effective after transfusion.

18 The onset of a remission following transfusion is due to reaction of the bone marrow.

19 Fresh activity on the part of the bone marrow may possibly be due to dilution of toxin or to direct stimulation of the marrow, but is more probably a result of the general improvement in nutrition following upon transfusion and the more effective exhibition of arsenic.

20 There is little evidence that a single transfusion of blood will continue to stimulate the bone marrow and to diminish the anæmia, unless arsenic is continued.

21 The advisability of transfusion should be considered, but the results are not sufficiently consistent or permanent to justify it being urged in all cases of pernicious anæmia which are stationary, progressive or critically ill, in spite of the usual means of treatment.

Over de Behandeling en de Oorzaken van Indische Spruw en Daarmee waarschijnlijk Aetiologisch Verwante Symptomen-Complexen

The Causation and Treatment of Indian Sprue and Other Symptom Complexes of probably Allied Aetiology, pp. 42 (No date or publisher)—ELDFRS (C)

The author maintains that sprue is a deficiency disease and not either an infection or a toxæmia. He gives detailed histories of eight cases, all of which recovered under dietary treatment. The patients were put on a diet of which milk, beef half cooked in butter, strawberries and green vegetables were the chief ingredients, carbohydrates being at first either prohibited altogether or very much restricted. The power of some patients to deal with lactose is so much diminished that milk is at first not well borne and must be withheld for a time. The author, who is described as Physician for Tropical Diseases at The Hague draws attention to the fact that in four of his patients who were born in the Dutch East Indies, sprue first manifested itself on their visiting Europe. It is, of course, well known that Europeans are the chief sufferers in the East Indies, and the author suggests that the

explanation of these converse facts is that Europeans in the East Indies and persons born in the latter visiting Europe do not know how to diet themselves suitably. The "symptom-complexes of probably allied ætiology" are pellagra and pernicious anæmia, both of which are, in the author's opinion, deficiency diseases—*Tropical Diseases Bulletin*

A Note upon the Modes of Infection in Bacillary Dysentery.

Jl Roy Army Med Corps 1919 Mch Vol 32 No 3, pp 209-214—COWAN (John) and MACKIE (F J)

WORKING in Alexandria in 1916 Cowan and Mackie investigated some of the methods by which the infection of bacillary dysentery was conveyed from one individual to another. Although their investigations were incomplete owing to the press of work, their data show that the source of infection was infected stools and that the possible modes of infection were (1) water (2) sand, (3) food, (4) flies, and (5) fingers. They lay little stress on the first four factors and consider that the personal equation requires further attention and investigation. The washing of hands after going to the latrines and before meals, though impossible in the field, is generally possible in standing camps. Infected hands may convey the infection to an indefinite number of people, if employed in the cook house or the dining room. They consider that direct personal infection is a factor that requires more attention than it has received in the past—*Tropical Diseases Bulletin*

Amœbic Abscess of the Brain with Notes on a Case following Amœbic Abscess of the Liver.

Jl Trop Med and Hyg 1919 Apl 15 Vol 22 No 8, pp 69-76—ARMITAGE (F L)

THE recent occurrence of a case of amœbic abscess of the liver and brain, observed by the author, led him to study the subject of amœbic abscess of the latter organ and to consider the literature of cases reported in the past. There is authentic evidence of 48 cases recorded from different parts of the world, most of the cases were from tropical or subtropical countries, 24 of the number occurred in Egypt, many were associated with or followed liver abscess.

The condition was most frequently observed between the ages of 20 and 40, but cases were reported in a child of 5 and an adult of 47 years. The majority of the patients were Europeans only three cases occurred amongst females none of the patients recovered. The abscess is described as being generally single, and occurs with equal frequency on the right or left side. Bilateral abscesses were found on six occasions. In recent acute cases there is no limiting pyogenic membrane in older cases there is a tendency to the formation of an abscess wall.

The differential diagnosis, from cerebral conditions complicating bacillary dysentery, metastatic abscesses, caseating tubercle of the brain, cerebral gumma and actinomycosis, is discussed. The mode of transmission of the amœbæ from an intestinal focus to the brain is considered. It is pointed out that there are no distinctive signs of the condition and that clinical features "depend on localization and on susceptibility of the host." The disease is rapidly fatal, death generally taking place from the 6th to 8th day after the onset of headache. Treatment appears to have no effect on the course of the infection.

The histories of some of the more important cases recorded are included in the text. The paper concludes with a full account of the recent case noted clinically by Majors Stout and Fenwick [see this *Bulletin*, Vol 12, p 290]. In this case on post-mortem

examination an abscess the size of a pigeon's egg was found in the inner part of the left frontal lobe, extending into the ventricle. It contained thin yellow pus. There was a zone of softening round the abscess and localized basal meningitis was present in the area.

This interesting paper should be of value in the future as it contains important information based on a consideration of the previous observations made on one of the less common complications of amœbic infection—*Tropical Diseases Bulletin*

Treatment of Malaria by Special Technic

Plus Ultra Madrid 1918 Oct Vol 1 No 4 p 186 (Summarised in *Jl Amer Med Assoc* 1919 May 3)—CASARESA BISCANZA (J M)

By this special method quinine (0.20 gramme) combined with arsenic is given in a large quantity of water at the beginning of the cold stage when the internal organs are hyperæmic and absorption from the stomach is rapid. As the cold passes into the hot stage the blood rushes to the skin, so that the copiously-absorbed quinine-water is diffused through the bloodvessels as effectually as if it had been injected, and moreover at the right moment for catching the young merozoites.

The originator of this ingenious method claims to have cured 897 out of 1,072 cases of malaria in a single course of 4 doses. 129 cases required a second course, and 46 a third, these being cases where the previous course or courses were not properly accomplished. The completeness of the cure was verified a year afterwards in 640 cases—*Tropical Diseases Bulletin*

The Effects of a Scrobatic Diet on the Adrenal Glands

Brit Med Jl 1919 Aug 16 pp 200—McCARRISON (Robert)

THE author notes that the weight of the adrenals of guinea-pigs dying from the result of a scrobatic diet is roughly double that of healthy ones. These organs show hæmorrhagic infiltration and disintegration of the cellular elements of the cortex and medulla. The changes may be present in animals that show no clinical evidence of scurvy during life, they are then regarded as pre-scorbatic in character. The total quantity of adrenalin in these glands, which are double their normal size, is however less than half that found in healthy guinea-pigs. In healthy pigeons the total adrenalin per gram of gland is about ten times greater than that found in healthy guinea-pigs, but in these birds when on a food deprived of all accessory factors the amount of adrenalin becomes increased, thus differing from what occurs in guinea-pigs. The evidence so far available, both in birds and mammals, points to the dependence of the functional perfection of the adrenal glands on the adequate supply in the food of accessory food factors of all classes. In birds the want of the factors of A class (fat soluble) attended with an excessive production of adrenalin is associated with the occurrence of œdema, and in guinea-pigs the want of factors of the C class with diminished production of adrenalin is associated with hæmorrhage into the body tissues—*Tropical Diseases Bulletin*

Experimental Scurvy in Monkeys

Jl Path & Bact 1919 May Vol 22 Nos 3, 4 pp 246-251—HARDEN (Arthur) & ZILVA (Sylvester Solomon)

In the experimental study of scurvy guinea-pigs have been almost universally employed, but as the animals differ so widely from man in their anatomy and methods of life the authors were induced to substitute

monkeys for their investigations, care being taken that the results were not complicated with production of incipient beriberi.

A diet was therefore given in which the anti-neuritic accessory factors, both water soluble and fat soluble, were present.

Three distinct experiments were carried out. In the first the animal was fed on steamed wheat germ, autoclaved bread, monkey nuts and rice, with the addition of 100 cc of autoclaved milk, this contained an abundant supply of protein and anti-neuritic factors (tested on pigeons). The monkey also received 150 cc. of fresh beer. The animal showed the first signs of scurvy in a little over three and a half months, it steadily got worse and was killed two weeks later, when the post-mortem showed evidences of an advanced stage of the disease.

In the second experiment the diet consisted of autoclaved rice, bread, and milk, one in which the anti-neuritic factors were practically absent. In four and a half months scurvy symptoms appeared and about a week later violent diarrhoea set in and the animal died. Post-mortem showed well marked scurvy, no evidence of beriberi was noted.

In the third experiment the diet was similar to that of No 1 but without beer. Marked scurvy symptoms again appeared in a little over three months, and increased. When the disease was apparently near its fatal termination, a cure was started and was quite successfully carried out. On the first day 25 cc of lemon juice, from which the free acids had been removed (equal to 100 cc. of original juice), was given by a stomach pump and the same amount on the following day, improvement was then noticed and doses were given of the treated lemon juice, equivalent to 150, 250 and 130 cc of fresh juice. Five days after the commencement of the treatment the animal was almost well and it continued on the same diet with 10 cc of lemon juice, on which it gained weight and appeared quite normal. Two months later it was killed, and no sign of scurvy was found.

The experiments are of great interest and show that scurvy can be produced in monkeys by a diet deficient in anti-scorbutic factor, and that the disease can be cured by addition of fresh lemon juice in large quantities. It is noted that the prophylactic use of fresh orange juice had also been demonstrated, a report of which experiments will be published later—*Tropical Diseases Bulletin*.

Inoperable Cancer and Other Conditions in which Radium is indicated

The Journal of the Tennessee State Medical Association, December, 1919—WILLIAM D HAGGARD (Nashville)

Some of the more important conditions treated by Haggard were all types of malignant growths, fibroid tumors of the uterus, enlarged prostate, lymphatic leukemia, leucoplakia, nevi—capillary, cavernous, moles, warts, papillomata, tuberculosis of glands, skin and joints, keloids and vicious cicatrices, lupus erythematosus, psoriasis, pruritus.

The results of radium treatment of sarcoma are, generally speaking more satisfactory than in any other form of malignancy. If treated in the early stages, the results are most gratifying. These tumors should be treated by insertion of tubes directly into the tumor substance and by external radiation as well. It has been found that the best and most satisfactory results are obtained in lympho-sarcoma, and the disappearance of these tumors is marvellous. Sarcoma of the tonsil and post-nasal space responds most satisfactorily also. Melanotic sarcoma has been found to be less amenable to treatment.

From the author's own observations, and those of Young, Janeway, Kelly and others, he presents the following conclusions

"1 The therapeutic application of radium is in its infancy, but indications are that its growth will be of increasing therapeutic benefit in the treatment of tumors, new growths, benign or malignant, and in the progress of certain other diseased conditions, as lymphatic leukemia, etc.

"2 It has been proven of value in the treatment of certain superficial diseases of the skin and mucous membranes, heben planus, lupus erythematosus, cicatrices, painful affections of the skin, moles, papillomata, warts, angioma, pigmented nevus, rodent ulcers, epitheliomata etc.

"3 Many benign tumors situated favorably are very satisfactorily treated with radium, as certain fibroids of the uterus, and some cases of adenoma of the prostate.

"4 Inoperable malignant tumors and growths are greatly benefited by its application. Sarcoma, best, carcinoma of cervix, next and lymph-adenoma carcinoma of lip, tonsil, esophagus, uterum and prostate are sometimes best treated by radium.

"5 Radium used intelligently in conjunction with modern surgery and medicine will aid much in lessening the suffering and in lengthening the lives of many of our fellow men.—*Journal of M*

i The Anti-scorbutic and Growth-promoting Value of Canned Vegetables

Lancet 1919 Aug 23 pp 320-322—CAMPBELL (Mabel E D) & CHICK (Harriette)

ii The Anti-scorbutic Value of some Indian Dried Fruits (a) Tamarind, (b) Cocum, and (c) Mango ("Amchur")

Ibid pp 322-323 CHICK (Harriette), HUMPHREY (Margaret) & SKELTON (Ruth F)

iii A Comparison between the Anti-scorbutic Properties of Fresh, Heated, and Dried Cow's Milk

Ibid pp 323-324 BARNES (Rosamund E) & HUMPHREY (Margaret)

The experimental work relating to these three enquiries was carried out at the Lister Institute at the request of the Controller of Horticulture and Food Production Department and is a continuation of much useful research, some of which has already been published, to determine the amount of anti-scurvy accessory food factors in various substances commonly used.

i Cabbage and runner beans were the two vegetables chiefly investigated, and it is shown that by canning the anti-scorbutic value is reduced from 70 to 90 per cent by the heat used in the preserving process. For runner beans the value of 20g was reduced to less than 5g. Not only is there loss of value produced by the preparation but this continues during storage. The growth-promoting accessory factor present in green vegetables is also to a great extent lost, but was present in the liquor. A useful table is given showing clearly the results obtained. Guinea-pigs were the animals used and to the basal diet free from anti-scurvy substances a certain amount of heated milk was added to supply the fat soluble growth factor.

ii Dried tamarind, cocum and mango have the credit in India of possessing anti-scorbutic properties of considerable value, but no experimental study had been recorded with regard to them. Guinea-pigs were again used as test animals, a basal diet of oats, bran and autoclaved milk was given and the various anti-scorbutic substances added.

The results are shown in a table. It was found that each of the three preparations possessed a definite but small anti-scorbutic value, less than raw cabbage, swedes, germinating pulses, oranges and lemon juice, but equal or superior to carrots, beetroot, cooked

potatoes and raw meat juice reckoned weight for weight

iii The anti-scorbutic value of raw cow's milk has in previous experiments by Chick, Skelton and Hume been shown to be much less than was generally accepted. The present investigation was carried out to determine the relative values of dried and raw milk.

Guinea-pigs and monkeys were used and the dried milk was the commercial brand manufactured by the Just Hatmaker process. Two samples were employed, one less than three weeks old, the second six to twelve months old. The fresh milk was the best procurable. Great care was taken to prevent errors of observation, and though eight monkeys only were used the conclusions arrived at seem to be justified. A table is given setting forth the details of the experiments. Cow's milk even when fresh was found to be comparatively poor in anti-scorbutic properties and large quantities, 100-150 c.c. for guinea-pigs and 125-170 for monkeys, were needed to protect the animals from scurvy. Dried milk was very inferior, about half as effective as raw milk. Scalded milk was distinctly better than dried milk. The deductions following from these facts are suggestive for infant feeding. There was also evidence to show that winter milk is inferior to summer milk as a food. The growth-producing accessory factor found in milk did not appear to be reduced in the process of preparation of dried milk, growth of the animals only falling off at the onset of scurvy symptoms—*Tropical Diseases Bulletin*

Gastric Ulcers: Recent Teaching on their Surgical Diagnosis and Treatment

PRESENT-DAY STATISTICS have revealed the disquieting fact that many gastric ulcers are malignant, and even if innocent at the commencement of disease tend, in a proportion of cases, to become malignant at their termination. Students will often ask their teachers this most important question "When does a chronic but otherwise innocent gastric ulcer become malignant," and the answer invariably given is that "we do not know." There are, it is true, a plethora of scientific observations which help to confirm a diagnosis, but they cannot be regarded as other than "aids to diagnosis." This is the crux of the new teaching, for previously much too great an amount of time was spent in performing "test meals," and in skiagraphing the gastro-intestinal tract subsequent to a "Bismuth Meal."

THE FALLACY OF GASTRIC ANALYSIS

For some years chemical pathologists have described a definite decrease in the amount of free hydrochloric acid in the stomach afflicted by carcinoma, but more recently an actual increase of the free acid has been discovered in cases of early carcinoma. Thus the value of such a test has fallen from its former "high estate" and is no longer treated very seriously by gastric surgeons. Moreover, such tests take up a good deal of time and are spoken of by Mayo as "this scientific and deadly delay."

A very strong condemnation, but quite justified, and that brings us to the other great item in modern teaching on this subject, "the urgency for laparotomy and possible operation in all cases of suspected gastric ulcer." As great an authority as Sir William Hale-White has made the following impressive dictum: "Indigestion or dyspepsia in a subject of middle age, which does not improve after a short course of medical treatment, should be explored by abdominal section."

"Without operation cancer of the stomach is absolutely hopeless," said Mr R. P. Rowlands in a clinical lecture delivered at Guy's Hospital last month. Spontaneous cure is not known, and medicine is of no use except to alleviate the symptoms of inoperable disease. Surely surgery can do better than this if given a fair chance, but too often the surgeon is not asked to see the patient until the diagnosis has become obvious and the prognosis is hopeless.

EARLY DIAGNOSIS

Cancer of the stomach, in its early stages, does not give rise to symptoms which can be said to be typical of the disease. Rapid and progressive wasting, anæmia, pain, anorexia, nausea, and vomiting are suggestive. These, and especially if accompanied by a palpable tumour or obstructive signs, will indicate the necessity for an early operation. Mayo and Rowlands advocate a very simple measure for the determination of gastric delay or obstruction, which in their opinion is of greater value than either the "test meal" or an x-ray examination. Some half-cooked rice and a few raisins are given with some soup in the evening, and if on washing out the stomach in the morning any food remnants are found there is clearly obstruction, and, even though this may be caused by a simple ulcer, it strongly indicates an operation, both for diagnosis and treatment.

RESULTS OF PARTIAL GASTRECTOMY

In the past the most common operation for gastric ulcer, whether innocent or malignant, was gastro-jejunostomy, by which the posterior surface of the stomach was united by anastomosis with the proximal loop of the jejunum. Such a measure relieves pyloric obstruction, but in the case of cancer is only palliative, unless some attempt is also made to eradicate the malignant disease itself. The American surgeon Mayo was the first to secure valuable results from an operation which he termed "Partial Gastrectomy." In this country the performance of gastrectomy was delayed for some years, because the immediate mortality was supposed to be very high, and the prospect of permanent cure or prolonged relief was believed to be poor.

In regard to this question of immediate mortality, Mr Rowlands says "The technique of partial gastrectomy has been so much improved in recent years that the mortality, in good hands, should not be more than 10 per cent, but resection for definite malignant disease is not likely to show such good results until the patients are sent for operation much earlier than they are in this country at the present time." "In early cases the operation is easy and comparatively safe, whereas in late cases it may be very difficult, prolonged, and dangerous. Therefore the careful selection of cases for operation is necessary." As regards the ultimate results, Mayo states that the patient with carcinoma of the stomach, which is sufficiently localised to be removed, has at least a 25 per cent chance of a five years' cure.

INDICATIONS FOR OPERATION

At the present time less than a quarter of the cases come to the surgeon soon enough to allow resection to be performed, nearly two-thirds are unsuitable for any operation, but in nearly a quarter of the cases an exploration is necessary to decide whether anything can be done. The danger of an early operation is very small, although a simple exploration in late and inoperable cases carries with it a considerable risk, as shown by the experience of Kronlein and Mikulicz, who had a mortality of about 9 per cent in such late explorations.

Clinical signs which indicate the growth to be inoperable are as follows: (1) Large size and fixation of the growth, (2) the discovery of dropped and grafted nodules of growth in the pelvis, (3) enlarged supra-clavicular glands, especially common on the left side, (4) nodules of growth at the umbilicus, or under the skin of the abdomen, (5) ascites, indicating obstruction of the portal vein by growth, (6) nodular enlargement of the liver, and (7) an exhausted and cachectic state of the patient.

An accurate diagnosis of the early stages of malignant growth can only be obtained by an exploratory operation, and this procedure, if performed early enough, is associated with little risk to the life of the patient. Partial gastrectomy is the great hope for these frequent cases of malignant ulcer. Its

technique is gradually improving and if only cases could be diagnosed more early the present mortality from this most distressing disease might be reduced by one half, or even more.—*The Hospital*

The Cause of Yellow Fever

LEBREDO, who is head of the section of epidemiology and enquiry of the Sanitary Institute of Havana, writes in the *Boletín de medicina Y cirugía* of Cuzyaquil (1920-18-19) about the work of Noguchi, who claims to have discovered the *Leptospira icteroidis* to be the real cause of yellow fever. LebreDO was a member of the Commission which studied the epidemic at Cuzyaquil in 1918, and so knows about the cases described by Noguchi. He concludes that it is not proved that yellow fever is caused by the *Leptospira icteroidis*, and he notes that Noguchi's possible transmission by the skin is in direct contradiction of the well-known fact that it is quite safe to perform without gloves an autopsy on a fatal case of the disease even if the pathologist be not immune by reason of having had yellow fever.

Acidosis in Nephritis

The Journal of the American Medical Association Vol 74 No 10 March 6, 1920—CHACE and MYERS

THE writers mention two main lines of defence against acidosis. The first is the carbonates of the blood, the second the power of the kidneys to secrete an acid urine from a nearly neutral blood through the medium of acid phosphate of soda. Other means are the blood and body proteins, and the formation of ammonia, but these latter are not effective in nephritis.

As regards the determination of the degree of acidosis the writers rely mainly on three tests, viz—

1 Lowered carbon-dioxide combining power of the blood which can readily be estimated by Van Slyke's method the normal range being from 55 to 75 cc per 100 cc of plasma.

2 Lower carbon-dioxide tension in the alveoli.

3 Retention of alkali by the body when the kidney is capable of secreting an excess. Normally from 5 to 10 gm sodium bicarbonate is sufficient to change the reaction of the urine.

The conclusions they arrive at are as follows—

All fatal cases of chronic nephritis with marked nitrogen retention show a severe acidosis, sufficient in many instances to be the actual cause of death.

In some cases of acute nephritis and acute exacerbations of chronic nephritis, the distress is apparently due to the acidosis, since the judicious use of sodium bicarbonate results in general clinical improvement. With the rise in the carbon-dioxide combining power of the blood, the dyspnea and hyperpnea disappear.

Hæmolytic Activity of Solutions of Arsphenamin and Neo-arsphenamin.

Journal of American Medical Association Vol 74 No 10 March 6, 1920—KOLMER and YAGLE

As a result of their experiments, details of which constitute the earlier part of the paper, the authors conclude—

1 All solutions of arsphenamin are hæmolytic, owing primarily to the direct hæmolytic activity of arsphenamin itself.

2 Solutions of arsphenamin in isotonic saline solution are from three to ten times less hæmolytic than solutions in water.

3 The hæmolytic activity of solutions of arsphenamin in water and isotonic saline is unavoidably increased by the addition of sodium hydroxid for purposes of neutralization, the addition of an excess of alkali increases hæmolytic activity.

4 Concentrated solutions of arsphenamin in water and isotonic saline are more hæmolytic than dilute solutions.

5 Neo-arsphenamin is not hæmolytic.

6 Dilute solutions of neo-arsphenamin in water, as 0.9 gm in 90 cc or more of water, are hæmolytic, owing to hypotonicity of the solution. Concentrated solutions, as 0.9 gm in 30 cc or less of water, are not hæmolytic, owing to the presence of sufficient inorganic salts from the drug to render the solution approximately isotonic.

7 To avoid hæmolysis in the administration of dilute solutions of neo-arsphenamin, sterile physiologic sodium chlorid solution prepared of freshly distilled water should be used, when the concentrated solutions are administered (each 0.1 gm dissolved in 3 cc or less), sterile distilled water may be employed.

8 The degree of hæmolysis produced by the administration of arsphenamin may be lessened (a) by using instead of water sterile saline solutions of such strength as to render the solutions isotonic, (b) by avoiding the administration of concentrated solutions, (c) by carefully neutralizing and "clearing" the solution with sodium hydroxid counting the drops, or otherwise measuring the amount necessary, and adding not more than a fifth of this amount in excess, and (d) by giving the injections slowly so as to permit gradual mixing and dilution of the solution with the blood.

Anaphylaxis in the Treatment of Hæmophilia

The Quarterly Journal of Medicine Vol 13 No 51 April, 1920—H W C VINCE

THE chief interest in this article lies in the use of the anaphylactic state and its phenomena as a therapeutic measure. Hitherto anaphylaxis in man has been regarded as a foreshadowing of possible disaster than as a means of possible benefit. The article is based on the findings in two cases of hæmophilia. Roughly the method

employed was the subcutaneous injection of a fairly large sensitizing dose (3 cc) of the serum used (horse or sheep) followed 12 days later by a minute intradermal dose (2/5 to 2 minims) repeated if necessary. It was found that the coagulation time fell rapidly after the intradermal dose in both cases. In Case I the coagulation time remained normal for 29 days. Case II has remained normal up to the time of writing—over forty days.

Discussing the nature of hæmophilia the writer favours Sahli's view that the condition is due to a deficiency of thrombokinas. Addis also showed that not only is there a deficiency in thrombokinas (thromboplastic substances), but in hæmophilic blood a greater quantity of these substances is required to effect clotting. From the results obtained in the present cases it would seem that the deficiency is relative and not absolute, for if the necessary stimulus can be provided it becomes apparently normal in action. In any case, the results quoted would seem to place the defect on the organic side of the clotting mechanism and not on the inorganic side, *e.g.*, to a lack of calcium salts.

As regards treatment, blood transfusion is looked on by most authorities as a specific for the actual hæmorrhage, but it cannot be regarded as a cure as the increased coagulability rapidly disappears.

Discussing the relation of increased coagulability to the anaphylactic state, the writer states that it must be concluded that the fall in the coagulation time of the two cases recorded is in some way due to the presence of the anaphylactic state.

The fundamental reasons and causes of anaphylactic phenomena are regarded by Zinsser as an acute intoxication caused by a poison produced by a proteolytic action of complement on the antigen-antibody complex. As regards the site of this reaction the balance of opinion would appear to favour the views of Pearce, Eisenbrei and Weil that the cellular and fixed antibody is responsible for the train of symptoms that occur.

However this may be, it may be supposed that by the intradermal injection of a protein, to which a hæmophilic patient has been sensitized, minute quantities of a substance, perhaps a product of proteolysis, become liberated in the body fluids, insufficient in amounts to cause gross signs of anaphylactic shock, but sufficient to stimulate the production of thromboplastic substances.

The general conclusions arrived at are as follows—

1 The intradermal reaction is a modified form of anaphylactic "shock," of general as well as of local significance, and in which the stimulation of the thrombogenic functions of the somatic cells is a salient feature.

2 The changes in coagulability of the blood in anaphylactic shock occur in two stages: a period of acceleration which occurs early,

followed by a period of retardation, further that the predominance of the former or the latter depends on the lesser or greater severity of the shock.

3 The intoxicating injection in a sensitized individual may act as a catalytic agent in inducing the intracellular reactions which constitute the anaphylactic phenomena.

4 In cases of hæmophilia the duration of the effect of the intradermal reaction is dependent on the duration of the anaphylactic period.

But the shorter or longer duration of this effect is also directly dependent on the greater or lesser severity of the hæmophilic condition.

Etiology of Yellow Fever: IX Mosquitoes in relation to Yellow Fever

Journal of Experimental Medicine 1919
Oct Vol 30 No 4 pp 401-410—
NOGUCHI (Hideyo)

THE investigations were undertaken in order to ascertain whether the behaviour of the organism isolated from Yellow Fever cases (*Leptospira ictteroides*) in relation to mosquito transmission conformed to the known characteristic of the yellow fever virus.

The following is the author's summary of his experiments—

"The foregoing experiments show that symptoms and lesions closely resembling those of yellow fever in man may be induced in guinea-pigs by the bite of female stegomyias that have previously sucked the blood of a yellow fever patient or of an animal experimentally infected with *Leptospira ictteroides*. With mosquitoes infected directly from a yellow fever patient the infectivity seems to become manifest after a longer period of incubation than with those infected with the animal blood. In the former, at least 12 days are said to be necessary before they become infectious, and this hypothesis seems to be borne out by the present experiment. On the other hand, the mosquitoes which were engorged with the infected blood of the guinea-pig were found to be capable of transmitting the disease within 8 days after this feeding. This discrepancy may be explained by the fact that the number of *Leptospira* existing in experimentally infected guinea-pigs is far greater than that in human blood.

"The frequency with which positive transmission by the stegomyia was obtained in both instances was very small indeed, in view of the number of mosquitoes employed. It appears that even under natural circumstances the percentage of mosquitoes that eventually become infected with the yellow fever microbe by sucking the blood may be very small. It has already been shown by previous investigators that to transmit yellow fever from a patient to a non-immune person requires from 0.1 to 2 cc of blood at the height of disease. According to my estimate a female stegomyia may take up 0.01 cc. or even less. Apparently a mosquito occasionally becomes infectious by taking up the one or two organisms which happen to be circulating in the peripheral blood of man, and it is these occasionally infected few which carry the disease. It is not difficult to realize the extent of ever increasing danger from a constant supply of the microbic virus which an endemic centre or an epidemic of yellow fever can provide. One infected mosquito may mean many patients and the life of such a mosquito is usually longer than that of the persons whom it fatally infects.

"Finally, it is of interest to note that the development and maintenance of *Leptospira icteroides* are indispensably associated with the blood constituent, the serum, and this is amply supplied by the blood-sucking insect. The organism is one of the most fragile of all the pathogenic parasites and cannot survive the concurrence of other less fastidious organisms such as bacteria. The comparatively aseptic body cavity of the stegomyia furnishes a secure shelter for the parasite which undoubtedly penetrates the zone of safety as soon as it is taken into the stomach of the insect. Unlike many other parasites, this organism is capable of penetrating the intact skin or a bacterin-proof filter, and hence it is probably an easy matter for it to pierce the tissue of the visceral organs of the mosquito. Whether or not *Leptospira icteroides* can survive and multiply only in the body of *Stegomyia calopus* and not in other varieties or genera is yet to be determined. Another interesting fact with regard to the extrinsic life of this organism is that it can multiply steridly at a temperature from 13—37 degrees C. The optimum temperature, at which it remains viable for many months is 26 degrees. The climate in most of the tropical countries offers optimum conditions both for *Leptospira icteroides* and for the mosquito which carries and nourishes it."

Calcium in the Body

Journal of the American Medical Association
Vol 74 No 16 April 17, 1920

CALCIUM, which makes up about one-fiftieth of the weight constitutes a larger proportion of the body than is represented by any other of the inorganic elements. This fact is by itself sufficient to lend importance to all considerations of the supply of calcium to the body. It happens that this element is distributed with considerable irregularity among the staple articles of food, so that its intake depends in no small degree on the qualitative character of the diet. Among animal foods milk stands almost alone in exhibiting a conspicuous content of calcium while among plant products few show even moderate richness in this element. Such facts are probably responsible for the significant statement that "the ordinary mixed diet of Americans and Europeans, at least among dwellers in cities and towns, is probably more often deficient in calcium than in any other chemical element."

In view of the widespread shortage of milk—"the calcium food"—in certain parts of the world, with a reduction in the use of milk following the higher price of this food in many places, the calcium problem in nutrition has become accentuated to an unusual degree. The practice of adding green vegetables, comparatively rich in calcium, to the dietary of infants has increased in recent years. Students of the subject have expressed the belief that the value of such feeding lies in the effect on the mineral metabolism of the organism. They have reported that in children showing a delayed development, improvement has been brought about by such additions, and they conclude, on the basis of the mineral content of a number of vegetables, that spinach is the best one to provide a salt addition.

From experiments on animals, McClugage and Mendel of Yale University gained the impression, through a study of carrots and spinach,

respectively, as substitutes for milk in furnishing calcium in the dietary, that their use does not always yield a pronounced advantage to the calcium metabolism. Presumably, therefore, it would be an unsafe procedure to use vegetables extensively as a dietary substitute for milk in the nutrition of children. That broad generalizations applicable to all species and ages are not yet justified however, is indicated by more recent observations in the Department of Nutrition at Teachers College, Columbia University. Rose has ascertained the utilization of the calcium of carrots in the human body on persons for whom the calcium intake was in every case close to the estimated minimum for equilibrium. In almost every case there was a positive calcium balance on the carrot diet. When approximately 55 per cent of the calcium was derived from carrots, one subject had practically the same retention as on a diet in which 70 per cent of the calcium was derived from milk. Hence Rose properly argues that it seems possible to meet the requirement of the adult human organism for calcium largely, if not wholly, from carrots.

Another question, involving somewhat differently the content of calcium in the daily intake relates to the possibility of increasing the content of this element in the blood by increasing the ingestion of calcium. This end is sought frequently in current therapeutic efforts, and calcium salts (chloride lactate, glycerophosphate) are often prescribed. The latest studies by Denis and Minot at the Massachusetts General Hospital indicate that it is difficult if not actually impossible, to enrich human blood in this way. Even 6 gm (90 grams) of calcium lactate administered orally each day for five days failed to alter the plasma content appreciably. It is possible, judging by the outcome of a few animal tests that when the initial concentration is very low the amount in the circulating fluid may be more decidedly increased. This needs eventually to be determined in suitable human cases.

Results of the Peptone Treatment of Asthma

British Medical Journal April 24, 1920 —
A G AULD, M.D., M.R.C.P.

As a result of his experience the writer divides asthmatical cases into three main groups —

Group I This group presents the following characteristics. General good health, little family predisposition, limited duration of the disease, regularity in recurrence of attacks, freedom from bronchitis and emphysema. Cases belonging to this group are rapidly and certainly cured by intravenous injections of peptone. In children the writer prefers to inject the solution into the spinal muscles, and utters a warning against the use of Witte's Peptone which may produce a severe local reaction.

Group II This group includes all cases with chronic bronchitis, and emphysema, and cases presenting cyanosis or an oppressed condition of the respiration. As a rule, the affection has lasted many years. In some of these cases, the only effect which can be produced by means of peptone is a temporary cessation of the attacks by a mildly toxic dose, but many cases may be permanently benefited, if not cured.

In discussing the rationale of the treatment, the writer points out that proteose is only feebly antigenic—that is, it has but slight power of sensitising to itself. It does not form complement-binding antibodies, and does not produce a precipitate with the homologous serum. As to whether proteose can desensitize to whole protein, the experimental results are rather conflicting.

Anaphylactic shock and peptone shock cause the same general and local reactions. The similarity extends to the local reactions characteristic of certain species. Thus, in the guinea-pig, bronchial spasm, in the dog, the congested liver, and in the rabbit, the block in the cardio-pulmonary circulation, are equally produced. One might therefore suspect that both are produced by the same toxic substance. This poison is supposed by some to be produced in the case of anaphylaxis by lysis of the antigen by antibody and complement, in the cases of peptone shock to be present in the solution injected. Van Slyke and Whipple found that injection of proteoses caused a rapid increase in autolysis of body protein, as evinced by an increase in the non-protein nitrogen of the blood. Hisanobu obtained precisely similar, but more intense, changes in anaphylaxis.

Dale is inclined to attribute the effects in both cases to an aggregation of cell colloids, and states that the antigen when applied to the isolated anaphylactic uterus acts in ten seconds, which time he considers too short for the elaboration of a poison.

The writer concludes —

“Contraction of an isolated muscular organ is only one element in a very extensive picture, and until some more convincing evidence is forthcoming, the anaphylactic shock and peptone shock may be regarded as produced by an identical toxic substance. Immunization by peptone, therefore, is applicable to cases in which the symptoms may be caused either by whole or split foreign protein. The milder cases of asthma are probably associated with the latter, clinical evidence for which has already been recorded, and one attack affords little or no protection. A good example of the same thing is afforded in the malarial paroxysm. In many of the severe cases of asthma no doubt a larger molecule operates, which is antigenic, and is succeeded by a period of desensitization. In either case proteose confers on the body fluids a resistance to the induced poison, when used either in small immunizing doses, or in one dose large enough to produce a definite reaction.”

Bacteriology and Pathology in Six Cases of Encephalitis Lethargica.

The Journal of Laboratory and Clinical Medicine—P. E. MORSE, M.D., and E. S. CRUMP, M.D.

THE report is based on material from six cases of “Lethargic Encephalitis,” representing the fatal portion of a larger series of cases which recently occurred at Detroit, Michigan.

The Bacteriological findings are summarised as follows —

1 A staphylococcus-like organism has been isolated in primary pure cultures from six consecutive cases dying of encephalitis lethargica.

2 This organism, when injected subdurally, produces a fatal lethargic state in rabbits and the organism is recovered from the brain in pure culture.

3 The filtered culture contains a poison which produces a fatal lethargic state in rabbits.

4 Evidence is offered in favour of this effect being due to a poison (toxin?) generated by the growth of the organism rather than by filterable virus.

5 Controls are reported to show that the lethargic state in animals was not due to the bouillon used for injection.

6 Agglutination experiments with patients' serum both in recovered and in sick cases are not productive of definite results, but are strongly suggestive.

In the August, 1919, number of this Journal C. M. Stafford described an organism obtained by spinal puncture of a lethargic patient, which answers the same general description as the one here isolated. Stafford's organism was non-pathogenic for rabbits intraspinally.

The Pathological findings may be summed up thus —

1 Low grade leptomeningitis with œdema and moderate round-cell infiltration.

2 Perivascular infiltration of the vessels of the white matter, especially of the caudate and lenticulate nuclei, optic thalamus, pons, medulla, and posterior horns of the cord with resulting œdema and milky hæmorrhages of surrounding parts.

In conclusion the writers discuss the clinical significance of the lesions in the following paragraphs —

“It seems to us that an *à priori* opinion could be arrived at regarding the essential nature of the lesion from a consideration of the clinical symptoms. In the first place, the fact that, in spite of a profound lethargic state lasting over weeks, the patient is often restored to normal speaks decidedly against any extensive parenchymatous brain lesion. Degenerated brain cells that could be diagnosed by “neurophagia,” etc., probably do not recover even if the patient lives, and we cannot explain the return to normal on the basis of a destructive, degenerative lesion of the gray matter. The few degenerations found are probably due to œdema and to injury of the

nerve fibre as it passed outward through one of the involved areas lower down. Much might be said for this point of view as to the relative unimportance of the degenerative lesion of the Betz cells by an analysis of the mental state of the patients, but this question is more properly discussed in a clinical paper.

The involvement of the cranial nerves probably the most constant single clinical manifestation of the disease is evidently due to the close admixture of white and gray matter in the pons and medulla. This point is well illustrated by the photographs, which show areas of severely involved white matter contiguous to cranial nuclei. We have been interested in the fact that we never find involvement of the motor cells of the anterior horn, but frequently find the vessels supplying the posterior root in the cord markedly affected. This finding correlates well with the fact that although the reflexes are frequently lost at the height of the disease paralysis is not present. This finding both pathologically and clinically sharply distinguishes this affection from Heine-Medin disease.

In short "encephalitis lethargica" is not a true encephalitis in the sense that we speak of general paresis or the cerebral form of poliomyelitis as examples of encephalitis, because ganglion cell destruction does not characterize lethargic cases. But we are dealing here with a typical example of low grade "meningomyelitis," the characteristic lesions being in the meninges and white matter of the basal ganglia, pons and upper cord. It has come to our attention through D. Camp of the University of Michigan that Marie in 1890 described cases similar to "encephalitis lethargica" and called them "acute multiple sclerosis." From a pathologic as well as clinical point of view this term has much to justify its use.

The Diagnosis of Acidosis

The Journal of Laboratory and Clinical Medicine, Vol IV No 6 March, 1919—J. J. R. MACLEOD

THE writer refers to the confusion in medical literature concerning the exact meaning of acidosis. The earlier conceptions of this condition were based on the discovery in the urine of diacetic and oxybutyric acids and their oxidation product, acetone. That such observations could not be taken as a reliable indication of impending acidosis in diabetes and other diseases was made clear by the fact that these "acetone bodies" were frequently met with in other conditions, such as starvation, whether complete, or involving carbohydrates alone.

The next step was to attempt to estimate the extent of acid production by titrating the blood with standard acid, using some colour indicator to determine when the point of neutrality was reached. Contrary to expectations, this method was found to be unreliable chiefly on account of the influence of the "buffer salts" and to the

fact that other constituents of the blood such as proteins and phosphates may under abnormal circumstances function as bases.

A further step depended on the discovery that intravenous injection of acids caused a marked diminution in the carbon dioxide content of the blood, and a similar condition was to be observed in cases of diabetic coma. The difficulty of estimation was, however, a serious stumbling block.

Following the above discovery Haldane, Priestley and Krogh formulated the hypothesis that the alveolar carbon dioxide is proportional to the relative amounts of carbonic and other (fixed) acids in the blood, and that when the latter are increased there must be a compensatory decrease in the former. Beddard, Pembrey, and Spriggs then found that in diabetic patients there was a marked diminution in the alveolar carbon dioxide when coma existed or was threatened. On the other hand it was discovered that alveolar carbon dioxide may be depressed in other diseases such as nephritis.

For the above reasons it has been suggested that the acidosis of diabetes should be called "Ketosis" since the acids produced are so closely related to the ketones (acetonones) and that the term "acidosis" should not be confined to cases of diabetic coma.

More recently the application of physical chemistry has modified our conception of acidosis in general. We are taught that when molecules of HCl or NaOH are dissolved in water they split up into ions, H' and Cl', Na and OH'. It is well known that H' ions carry positive charges and OH' ions negative. The acidity or alkalinity of a solution depends on the relative preponderance of H' and OH' ions, and the true acidity of a solution will be represented by the excess of H' ions over OH' ions, that is by the H' ion concentration (C). The standard of perfect neutrality will be where H' and OH' ions exactly balance each other. In pure water nearly all of the H' and OH' ions are combined to form H₂O. The product of the H' and OH' ions is 1.2×10^{-14} and since in water they are present in equal quantities the H' ion concentration must be 1.2×10^{-7} , which means that this ion is present so as to form a 0.000,000,12 N solution, or 1.2 gm. H' in 10,000,000 litres.

When acid is added the concentration of H' ions rises, but that of OH' ions falls, so that, as in pure water, the products remain 1.2×10^{-14} . For this reason the reaction of alkaline solutions may also be expressed in terms of H' ion concentration. Whenever it is greater than 1.2×10^{-7} the reaction is acid, but when it is less the reaction is alkaline.

We may therefore determine the acidity or alkalinity of a solution by determining the H' ion concentration. There are two ways in which this may be done, namely, the electrical and the colorimetric. The former, which is the more accurate, consists in measuring the voltage or electromotive force set up in a battery of which

one electrode is pure hydrogen gas in intimate contact with the solution whose C_H we desire to measure, and the other electrode is one of known voltage, the so-called calomel electrode. Now the *rate of diffusion* between the free H' ions in the solution we are testing and the Hydrogen which constitutes the one electrode, will depend on the *concentration of the free H' ions*, and since the *total electromotive force* of the battery depends on the *rate of diffusion*, it in its turn must be proportional to the C_H of the unknown solution.

The colorimetric method depends on the fact that with certain indicators, such as sulphophenolphthalein, rosolic acid, and neutral red there is a fine gradation from the typical acid colour to the typical alkaline colour, so that if we have solutions having slightly variable but known H' ion concentrations about the neutral point, and add to each a drop of one of the above indicators, we shall obtain a series of standard tints. With these we can determine the C_H of an unknown solution by mixing it in a test tube with the selected indicator, so that the proportion of indicator and solution is the same as in the standard solutions. The standard tint with which this mixture matches gives the C_H of the unknown solution.

In the case of blood the colouring matter and proteins must first be got rid of, and this is best done by placing a few cubic centimetres of blood in a collodion tube suspended in neutral physiological saline. The saline soon assumes the same C_H as the blood and this can then be measured as described.

When C_H of the blood is measured by one of these methods it is found that it is practically always the same— 0.4×10^{-7} at 38 degrees C. Even in severe cases of acidosis an increase in C_H becomes perceptible only towards the end. Measurement of C_H is therefore of little clinical value. We must then turn to the study of the changes which eventually result in an increase of the C_H and the nature of the mechanism by which neutrality is maintained in the organism. We know that the blood is capable of absorbing a relatively large quantity of acid without an increase of C_H . This has been called the "buffer action" or "tampon action" of the blood. A clue to its nature has been furnished by the behaviour of solutions of phosphates and bicarbonates. Such solutions exhibit a similar buffer action. In the case of blood plasma it is the bicarbonates to which the buffer action is due, as phosphates are present in plasma only in minute quantities. The C_H has in fact been found to be proportional to the ratio existing between carbon dioxide in solution as H_2CO_3 and sodium bicarbonate $NaHCO_3$ multiplied by a constant, or, expressed in chemical notation, C_H is equal to the molecular ratio $H_2CO_3/NaHCO_3$. This ratio is $\frac{1}{20}$, and we may define acidosis as any condition in which the

proportion between H_2CO_3 and $NaHCO_3$ becomes greater than 1 in 20. This applies only to isolated plasma. When whole blood is used other substances come into play, such as the phosphates in the corpuscles, and proteins which may function as weak acids or alkalis. For practical purposes, however, we may regard the behaviour of the ratio $H_2CO_3/NaHCO_3$ as affording important indications in the detection of threatened acidosis.

If we study the behaviour of this ratio we find that the addition of an acid to the blood will diminish the denominator ($NaHCO_3$) and increase the numerator (H_2CO_3). In order to keep the ratio constant H_2CO_3 must be removed and this function is performed by the lungs. Since, however, the total amount of $NaHCO_3$ must be diminished the concentration of H_2CO_3 must fall correspondingly, and as the alveolar concentration of CO_2 depends on the concentration of the gas in the blood, it too will fall, so that the percentage of CO_2 in the alveolar air must be a measure of the available $NaHCO_3$ in the blood, or in other words the reserve alkalinity.

The rate of pulmonary ventilation is adapted to the amount of CO_2 to be eliminated by the action of the respiratory centre. It is commonly taught that the stimulus to the respiratory centre resides in a slight increase of C_H which takes place in spite of the buffer action. This is probably incorrect, for R. W. Scott has shown that CO_2 can excite the centre quite independently of the H' ion concentration of the blood.

Now there are technical difficulties to be met with in collecting alveolar air so that we cannot be certain of the results even under strictly controlled conditions. Further there is the fact that the respiratory centre may be influenced by other circumstances than mere concentration of CO_2 in the blood, *e.g.*, the supply of arterial blood and nervous impulses.

For these reasons most recent observers (Morawitz, Walker, Van Slyke and Cullen) have returned to blood examination for the detection of impending acidosis. The property, which it has been sought to measure, is the power of the blood to absorb CO_2 . Since the amount of CO_2 absorbed depends on the alkaline reserve and is a measure of the same. According to Haldane's method, a cubic centimetre or so of defibrinated blood is exposed at body temperature for 20 minutes in an air-tight vessel to an atmosphere containing a known amount of CO_2 . A measured sample is then removed to the gas analysis apparatus of Haldane-Barcroft and the CO_2 determined by decomposing the carbonates with strong acid after getting rid of the oxygen by shaking with ferricyanide solution.

This method has two advantages over Van Slyke's method with oxalated plasma.

1. There is greater risk of leakage in the latter.

2 It does not involve the use of mercury

The use of the whole blood, too, is likely to yield the most accurate results

The chief criticism against such demonstrations is that they tell us little if anything concerning the acid-absorbing power of the tissues. As a test of the acid buffer in the intact animal estimation of CO_2 in the alveolar air would seem to be better

Various observers have attempted to find some sort of parallelism between the CO_2 absorbing power of the blood and the alveolar CO_2 , but without success. This, however, may be due to the fact that under the conditions in which the alveolar air samples are taken, the alveolar CO_2 must be in equilibrium with the CO_2 in the arterial blood and not the venous blood. It is believed that a closer parallelism will be found to exist between the alveolar CO_2 combining power of the plasma when the sample of alveolar air is taken under conditions which ensure its being in equilibrium with venous, not arterial, blood

From the foregoing considerations the author concludes that it does not appear that there is a simple, thoroughly reliable method by which the buffer action of the body as a whole can be measured

There remains, however, an entirely different plan of attacking the problem, *viz.*, to observe the acid excretion by way of the urine. There are two ways in which this may be done —

1 To measure the total urinary acid excretion, this entails determining the amount of acid salts, free acids, and salts of ammonia in the urine. The free acids and acid salts can be measured by titrating the urine with sulphophenolphthalein which changes tint at about the C_{H} of the blood, or phenolphthalein which reacts neutral to urine when the CO_2 combining power of the blood plasma is at its maximum. By adding to the figure thus obtained that of the acids combined with ammonia, the total urinary acid excretion is obtained. This is said to have a definite relation to the CO_2 combining power of the blood plasma

2 To see how much alkali can be added to the organism without causing the urine to assume an alkaline reaction, Sellards, Palmer and Henderson found that in normal individuals only 5 grams daily can be taken without rendering the urine alkaline. When the alkaline reserve is seriously depleted as much as 100 grams per diem may be required. Objections to this method on the score of faulty elimination (when the kidneys are diseased) have been raised, but the author concludes from the Sellards' work that "it is no doubt the best test of acidosis at present available in routine clinical work"

In conclusion the writer classifies the conditions which might cause instability of the C_{H} of

the blood and give rise to acidosis or alkalosis, respectively, as follows —

Addition or accumulation of acid	Increase of C_{H}
	Accumulation of CO_2 (respiratory conditions) Incomplete oxidation of carbohydrate (lactic acid in muscular exercise) Defective oxidation of fat (ketosis) Renal insufficiency (nephritis) Decomposition of protein (as in acidosis of fever) Intestinal fermentation Administration of acid (experimental)
Decrease of base	Diarrhoea and hemorrhage respectively (may explain acidosis in cholera and in certain forms of shock)
Addition or accumulation of base	Decrease in C_{H}
	Ammonia (faulty metabolism of urea) Intestinal putrefaction (infantile conditions) Administration of alkalis (experimental)
Removal of acids	Excretion of CO_2 (excessive pulmonary ventilation, as in faulty ether administration) Excretion of acid urine

Reviews.

SYPHILIS.—By K. K. CHATTERJI. Published by Messrs Butterworth & Co., Calcutta. Price Rs 15 net

THE presentation of the subject of syphilis within the compass of a single volume is nowadays by no means a simple matter. The author has produced an extremely interesting work, in which the various aspects of the disease in its relation to the individual and society at large are reviewed, and there will be few practitioners who will not gain something from its pages. Attention is focussed mainly on the clinical side, which is fully described and illustrated by some good plates. Much space is devoted to treatment and the reader will find here detailed information regarding modern methods of attacking the disease, with the indications and, still more important, the contra-indications for each, with illustrations drawn from the writer's own experience. This section is very well done, particularly the chapter on the treatment of lesions of special parts.

His results with the various marmoset products are interesting and merit further investigation. The general pathology and clinical appearances of the various lesions are fully described and the differential diagnosis given. An account is included of the micro-biology of the treponema, and the nature of the Wassermann reaction is briefly stated. He notes the importance of all Wassermann tests being done by an expert, and consequently does not enter into its technique.

In discussing prophylaxis he draws timely attention to the connexion between syphilis and infant mortality. He emphasises the duty of

parents in instructing the young in the vital question of sexual hygiene. There is much force in his remark "that directly or indirectly the State has to bear the expenses." In dealing with the much vexed question of prevention his observations as to how conditions in India may operate to prevent the early marriage system from acting as an efficient prophylactic are of interest. The writer is interested in theoretical conceptions and in many parts of the book we find references to matters which are obscure at present, *e.g.*, the possibility or not of immunity in syphilis, the influence of mercury on alexines, the chemical transformations in the body of salvarsan and cognate questions. These might be collected together in a separate chapter in another edition. The book opens with a foreword by the late Lt-Col W D Sutherland, C.I.E., I.M.S., and concludes with a full bibliography. We congratulate Dr Chatterjee on his work.

TREATMENT OF THE NEUROSES.—By ERNEST JONES, M.D.
First Edition. Baillière, Tindall and Co. Price 10s 6d

"WHEN the practice of medicine was gradually emancipating itself from the hands of the priesthood, the process was not thoroughgoing enough to include mental therapeutics (then applied in the form of faith-healing, exorcism, and so on), and what part of this is still retained by the somewhat intermittent efforts of the clergy has become the heritage of quacks to a greater extent than of physicians. Even now to many medical men the very idea of mental therapeutics has a distinct flavour of the non-rational, or actually mystical, and is not absolutely separated in their minds from that of imposture, they tend to regard a cure induced in this way as a sort of cheat, a jesuitical achievement of a laudable aim by ignoble means." So writes the author of "Treatment of the Neuroses" (p 53), for without a doubt the general public as well as many doctors do appear to agree that every man should do his best to hide any troubles of a mental nature, not only from his friends but even from his physician, though he may speak of his physical disabilities to everybody with unblushing frankness. This, too, is all the more remarkable when one realises the extreme antiquity of mental therapeutics. As the author observes, mental therapeutics reaches back beyond the dawn of history and is probably as old as the earliest form of religion. Æsculapius, whose ophitic emblem is still our own, was above all a psychotherapist. To this tendency to regard mental therapeutics as something not entirely divorced from charlatanry may possibly be attributed the fact that it still fails to obtain that measure of interest and attention to which it is undoubtedly entitled. Hence medical education throughout the Empire continues in urgent need of the introduction of systematic training in the principles of clinical psychology, and asylums still stand in regard to their

constitution and administration where they were fifty years ago.

With what a measure of satisfaction would the author of "Erewhon" have read such a profession of opinion as that expressed on page 215 "Neurosis is the price, and it is far from being the only one, that society pays for its hypocrisy, for its intellectual and moral obliquity."

To all engaged in psychotherapy this latest book of Dr Jones will be an immense source of interest and pleasure. He is already well-known as the most eminent English exponent of Freud's philosophical psychology and system of mental therapy. In the introduction he deals with the significance and frequency of neuroses, and animadverts pithily on the loss in social efficiency caused by this type of ailment. He justly deplores the extreme divergence of views that still exists in the medical profession as to the ætiology, classification, pathology, diagnosis, and treatment of the neuroses. He follows the classification of Professor Freud in which he recognises three simple or "actual" neuroses—neurasthenia, anxiety neurosis and hypochondria, and four psychoneuroses—conversion-hysteria, anxiety-hysteria, fixation-hysteria, and the obsessional neurosis. The second chapter deals exhaustively with hysteria and the varieties of treatment that have been and still are employed to cure it. As is only to be expected from so devoted a disciple of Sigmund Freud, psychoanalysis is treated at considerable length and the conclusion is drawn that mental therapy by psychoanalysis is more successful on the whole than any other method, in spite of all the drawbacks attached to this method, all of which are faithfully portrayed and discussed by the author. The next portion of the book deals with the anxiety neuroses, and the strikingly protean nature of this variety of mental morbidity is fully emphasised and explained. Chapter VI relates to obsessional neurosis or, as it is sometimes called, "compulsion-neurosis" (Zwangsneurose). The intensity of the mental torment which is so frequently associated with this common disorder is rightly insisted on, and the author reminds us how frequently obsessional neurosis develops in unusually intelligent persons, generally of the male sex. No one who has had any practical experience of this malady will disagree with the author's statement that the obsessional neurosis is particularly well-suited to treatment by psychoanalysis. The author then goes on to discuss hypochondria and fixation-hysteria, and follows this up with an admirable chapter on the traumatic neuroses. Here he calls attention to the problems which still remain unsolved as regards the pathogenesis of that type of neurosis which has earned the rather unfortunate name of "Shell-shock." The author points out that if "shell-shock," that is, injury or mental and bodily suffering of all kinds, is to be held as the main cause of the traumatic neuroses, we have yet to explain why

such a small proportion of the total combatants in the recent war were affected and the extraordinary disproportion between the cause and effect, since some of the worst cases occurred behind the lines without exposure to trauma. The author insists with perfect justification that the central problem in the genesis of war shock is fear, and he supports Freud's contention that up to the present we have been too generous in admitting the phenomena of fear into our conception of normal instincts and that we have not exercised sufficient care in discriminating between the normal manifestations of the fear instinct and morbid ones. He further alludes to the theory founded on recent studies of dementia præcox that the earliest form of infantile love is self-love or "narcissism," and the passage from this stage of development to later forms of love is often far less complete than is generally imagined. He concludes his review of the traumatic neuroses by expressing the opinion that the source of the morbid fear in most cases of war neurosis appears to be repressed narcissism and that it is possible even in our present state of knowledge to predict which men will be more liable to suffer from war shock or any similar trauma. The chapter dealing with the problem of prophylaxis of the neuroses is exceptionally interesting and suggestive. The author considers the question in its three chief aspects *viz.*, individual hygiene, social organisation, and education. He holds that marriage for any neurotic is a hazardous proceeding, in spite of the prevailing views to the contrary. He points out how we have already gained sufficient knowledge to enable us to recognise the injurious effects of unhappy marriages on the future development of the children concerned, the seriousness of protracting indefinitely a life of sexual abstinence—particularly in the case of persons of a certain constitutional type—the illusoriness of regarding marriage as necessarily offering a cure for celibacy, and the impossibility of enforcing without grave harm a uniform and inelastic standard and mode of living. The author appears to be wholly pessimistic as to the results of the epidemic of "sexual enlightenment in the schools" that is now sweeping over most civilised countries, since such "enlightenment" is nearly entirely concerned with warning children, *i.e.*, with the negative instead of the positive aspects of the problem—a procedure which compares very poorly with the method of sexual enlightenment employed by many of the negro races of Africa, among whom the ancient and invaluable rites of initiation into manhood and womanhood confer inestimable moral benefits on the pubescent young of both sexes.

The book concludes with a short chapter on the mental treatment of conditions allied to the neuroses, among which the author makes reference to the psychoses, alcoholism, drug-habits, homosexual inversion, and sexual perversion, concluding with a short paragraph on criminality

and miscellaneous mental anomalies. At the end is furnished a profuse bibliography, containing an immense number of very valuable references to foreign literature on the subjects discussed.

ANNUAL REPORTS

REPORT ON THE STATISTICAL RETURNS OF THE PROVINCIAL LUNATIC ASYLUM IN ASSAM FOR THE YEAR 1919

COL J. GARVIE I.M.S. INSPECTOR GENERAL OF CIVIL HOSPITALS, ASSAM

1 Major J. W. McCoy I.M.S. held charge of the Provincial Lunatic Asylum at Tezpur throughout the year 1919.

Third grade Sub Assistant Surgeon Muktar Hussain was the Deputy Superintendent throughout the year.

General

2 The total number of lunatics confined in the Asylum at the close of the year 1918 was 391 including 4 observation cases of whom 312 were males and 79 females. During the year under report 101 (86 males and 15 females) were admitted into the Asylum including 6 re-admissions; the corresponding admission figure for 1918 being 110.

3 There were 6 re-admissions of whom 5 were males and 1 female against 4 and 1, respectively, in the previous year. The intervals since discharge were in 5 lunatics 11 months to 5½ years, and in 1, 3 months.

4 The number of discharges excluding 2 escapes and 9 observation cases found sane was 64 against 40 in the previous year. Of these, 60 were discharged cured and 4 were made over to their friends as mentally improved.

5 There were 20 escapes during the year under review against the same number in 1918 of whom 2 remained uncaptured at the end of the year. All cases of escapes were duly reported to the Magistrates concerned and the police. Adequate punishment was imposed on keepers responsible for the escapes.

6 The daily average strength rose from 376.71 in 1918 to 402.65 in 1919.

7 On the 31st December, 1918 there were 137 criminal lunatics in the Asylum, and 33 were admitted during the year under report of these, 3 were discharged, 1 escaped who is still at large and 6 died leaving 160 in the Asylum on the 31st December 1919. The daily average strength was 145.89, against 129.85 in 1918.

8 Classified by religion, 65 were Hindus; 10 Muhammadans, 3 native Christians and 10 other castes, *i.e.*, a total of 88. These figures do not include 2 observation cases carried over to the next year and 5 cases discharged as sane. Of these 88 fresh admissions, 55 were natives of the province, 21 came from other provinces while the residences of the remaining 12 were unknown. In the province itself the districts of Sylhet, Sibsagar, Darrang and Cachar were responsible for the largest number of patients, *viz.*, 12, 11, 9 and 7 respectively. It is a matter for consideration whether recently imported coolies should not be repatriated to their own provinces and homes.

9 Cultivators and tea-garden coolies furnished the largest number of admissions. As in previous years the admissions were mostly during the age period 20 to 40 years.

10 There is nothing special to note about the types of insanity. Predisposing causes were known in 23 cases and the exciting causes in 31. In 2 of these cases both the predisposing and exciting causes were known. No cause was assignable in 36 cases.

Vital

11 The total number of admissions to hospital was 138, against 195 in the previous year, with a daily average sick of 95.32, against 89.36 in 1918 the cases of epilepsy or epileptic fits being included. The increase

in daily average is due to malaria and diarrhoea, probably the sequelae of influenza. The fall in number of admissions to hospital is due to the fact that only 39 cases of influenza occurred in 1919, against 97 in 1918. During the year under review, the number of admissions from tuberculosis was 5, against 11 in 1918, of these, 2 cases were admitted into the Asylum with tuberculosis. There were 21 deaths in 1919, against 22 in 1918. The percentage of new admissions with bad health was 19.80, with indifferent health 50.50, and with good health 29.70, against 27.88, 45.19 and 26.92, respectively, in the previous year. Amongst these 21 deaths, 3 cases admitted with bad health died within the year and within a period varying from a fortnight to 3 months from the date of admission to the Asylum, 4 cases from senile decay and 2 from cerebral hæmorrhage in men of 83, 70, 65, 62, 75 and 40 years of age. One criminal lunatic suddenly kicked another non-criminal lunatic at night the latter died immediately as a result of rupture of spleen. The accident was too sudden to be prevented. One criminal lunatic in a cell climbed to the window sill of the cell and fell. He died within 24 hours as a result of fracture of skull. The Executive Engineer has been asked to bevel the edge of the window sill so as to allow of no place where a lunatic could find a rest. One criminal lunatic committed suicide by hanging in the night latrine of a temporary barrack.

The ratios of deaths per cent of average strength amongst the inmates of the Lunatic Asylums in the different provinces of India in 1918 and 1919 were as follows —

	1918	1919
Assam	5.84	5.21
Burma	7.84	9.66
Central Provinces	8.50	13.62
Bengal	9.63	10.03
Bihar and Orissa	10.63	14.15
Madras	13.57	
Bombay	14.4	15.0
Punjab	14.83	10.51
United Provinces	16.83	8.75

Finance

12 Excluding receipts from paying patients and miscellaneous receipts which are credited to Government, the total expenditure for the upkeep of the Asylum amounted to Rs 79,286-4-3 in 1919, against Rs 74,068-8-9 in 1918. The average cost per head was Rs 196-14-7, against Rs 196-7-11 in the previous year. The increase in the total expenditure was due to a large increase in the number of inmates and also to an increase in the price of dietary articles and clothing. Excluding the Public Works Department charges, repairs and maintenance charges, rates and taxes, receipts from paying patients and profits on manufactures, the average cost per inmate works out to Rs 147-12-10, against Rs 139-3-10 in 1918. The profits in the Manufactory Department were Rs 9,110-13-5, against Rs 5,975-12-5 in 1918, or an average of Rs 81-4-10 per head of inmates employed on manufactures. The cost of diet amounted to Rs 42,770-4-11, against Rs 30,034-4-9 in 1918, or an average cost of Rs 106-3-6, against Rs 79-11-8 per head of inmates.

Miscellaneous

13 The male inmates are mainly employed on cultivation of vegetables, sugarcane, repair of buildings and palisading, tailoring, manufacture of molasses (gur), cooking, and daily routine of systematic cleaning and disinfection of buildings and of clothing and cots. The females are employed on paddy-husking and sundry petty works within the female enclosure.

14 Including general wards, solitary cells, hospitals and tubercle wards, there was on the 1st January, 1919, accommodation for 315 males and 97 females, or a total of 412. No additions have been made during the year under review.

The maximum number confined on any one night during the year under report was 332 males and 79

females, or a total of 411. The overcrowding is relieved by converting a godown into a barrack when needed. Government has sanctioned the construction of a ward for 26 male inmates and a ward for 16 filthy patients, which will probably be well in hand by the 31st March, 1920.

15 Night-soil is trenched on a selected site in the Asylum ground outside the stockade regularly and properly, but infectious stools are destroyed in an incinerator. Latrine parade in the garden continues. Water-supply is good and sufficient. Extra allowance of milk, rum, egg and mustard oil are given to inmates of poor health and tubercular cases. There is ample supply of good vegetables in the Asylum garden. The clothing of inmates is boiled and washed weekly.

16 During the year under review the Asylum was visited once by the Hon'ble the Chief Commissioner of Assam, once by the Inspector-General of Civil Hospitals, Assam, and once by the Commissioner of the Assam Valley Districts. Twelve meetings were held by the visitors during the year.

REPORT ON THE ADMINISTRATION OF JAILS IN ASSAM IN 1919

THE following Government Resolution on the above deals with all the main features of interest, and may be quoted *in extenso* —

The total number of admissions into the jails of the province fell from 11,750 in 1918 to 11,475 during the year under report and the daily average population from 2,567 to 2,354. On the last day of the year accommodation was available for 2,954 prisoners as against 3,053 in the previous year. This decrease was due to the destruction by fire of the subsidiary jail at South Sylhet and to the dismantling of the temporary sheds erected in the previous year for the accommodation of prisoners in *hât* looting cases.

2 The number of deaths was 57 against 55, and the death-rate per mille 24.21 against 21.42 in 1918. An outbreak of influenza in the Sylhet Jail was responsible for 10 deaths out of 57. The jail and provincial death-rates in the last two years were as follows —

	Death-rate in Jails	Provincial death-rate
1918	21.42	46.10
1919	24.21	50.09

3 The number of juveniles admitted was 14 against 7 in the preceding year. Of these, seven were sent to the Hazaribagh Reformatory School. Of the remaining seven all except one were too old to be sent to a Reformatory.

4 A noticeable feature of the year's administration was the larger number of escapes among convicts, *viz.*, 14 against 5 in the preceding year. Most of the escapes took place while the prisoners were at work outside jails, and it was generally found that the escape was facilitated by disregard of rules. The guards in fault were duly punished.

The fact that there were four escapes from one sub-jail—North Lakhimpur—calls for some special explanation.

The number of escapes among under-trial prisoners was 3 against 6 in 1918.

5 Sentences of simple imprisonment were passed in 14 cases in which the law allowed the infliction of rigorous imprisonment.

6 The Chief Commissioner observes with regret that under-trial prisoners were, in some cases detained for long periods. The average period rose from 18.38 to 20.18 days. Sir Nicholas Beatson-Bell trusts that all concerned will make a real effort for improvement.

7 The number of corporal punishments inflicted during the year was only 3.

8 The pay of the warder establishment was raised and the service was made pensionable. It is hoped that these changes will improve its *personnel*. Full

Pre-Natal Feeding

A great authority dealing with ante-natal mortality has stated that for every infant dying under one year of age we may reckon another death amongst the unborn babies, so that which we are accustomed to speak of as our appalling Infant mortality is really double what it is stated to be

But this fact gives the key to the problem of how to deal with infant mortality. Beyond question the mother herself is the key to the whole position

It is useless attempting to remedy the evil after the child is born if it has been starved through the ill-nourished body of the mother. Yet it is possible whilst the mother is apparently well fed and cared for that her diet is lacking in the essential factors of growth and development.

All recent food investigations have shown that it is essential that the mother's diet should be rich in certain living food substances known as vitamins, and that however well the diet may be balanced in its chemical constituents, a deficiency in this respect will mean arrested growth, rickets, and lowered power of resistance to disease on the part of the child

The constituents of Virol are precisely those needed in pregnancy and lactation. It is because Virol is rich in those living substances or vitamins essential to growth, and because it is also a well-balanced diet, that it has achieved such remarkable results in restoring those wasted and ill-nourished children that have been the victims of improper feeding, and in building up strong, healthy, and consequently contented and happy children

VIROL

Virol Limited, 148/166, Old Street, London. E C.

MR. J H P FRASER, OBE, of the Political Department, is granted privilege leave for 4 months and 18 days, combined with commuted furlough on full average salary for 4 months, and ordinary furlough for 12 days, under articles 233, 260 and 308 (b), Civil Service Regulations, with effect from the 10th May, 1920

MAJOR L H S JAMES, of the Political Department, is posted as Deputy Commissioner, Hazara, with effect from the 10th May, 1920

THE Secretary of State for India has approved the grant of vacant Good Service Pensions to the following officer —

Lieut-Col P F O Connor, CB, Ind Med Service

THE KING has approved the retirement of the following officers

INDIAN MEDICAL SERVICE

COLONEL C MACLAGART, C.S.I., C.I.E., MB 29th March, 1920

Colonel J T Daly, MB, 1st April 1920

Lieut-Colonel J J Bourke, C.I.E., MB, 1st April, 1920

Note—IMS In the notification in the Lon Gaz dated 9th March 1920, regarding the admission of Jagat Ram Kochhar MB to the Ind Med Service, insert the heading "*To be Lieutenant*" above his name

THE KING has approved the grant of temporary rank in the Ind Med Service (as shown below) to the under-mentioned gentlemen —

To be temp Captain

David McEachran, MB BS (Edin), 25th February 1920

To be temp Lieutenant

John Thomas Dier, 11th March, 1920

The KING has approved the grant of the honorary rank of Captain in the Ind Med Service to the under-mentioned gentleman —

Gokal Prasad Tiwari, Civil Asst Surgeon, late temp Capt, IMS, 30th August 1918

THE KING has approved the promotion of the following Officer of the Ind Med Service —

Captain to be temp Major

R E Flowerdew, MB, 1st August, 1918

RETIREMENTS

SUBJECT to His Majesty's approval, Major Frederick O'Dowda Fawcett has been permitted by the Right Hon'ble the Secretary of State for India to retire from the service on account of ill-health, with effect from the 2nd February, 1920

SUBJECT to His Majesty's approval, Lieutenant-Colonel William Henry Cazaly, MB, has been permitted by the Right Hon'ble the Secretary of State for India to retire from the service, with effect from the 14th March, 1920

SUBJECT to His Majesty's approval, Colonel Fairlie Russell Ozzard (Bengal) has been permitted by the Right Hon'ble the Secretary of State for India to retire from the service, with effect from the 20th May, 1920

SUBJECT to His Majesty's approval, the undermentioned to be temporary Lieutenants, with effect from the dates specified —

Chandrashankar Prabhashankar Bhatt, MB, dated 6th March, 1920

Raghavacheri Rajagopalan, dated 20th April, 1920

SUBJECT to His Majesty's approval, the services of temporary Lieutenant Sitaram Visvanathan are dispensed with, with effect from the 2nd April, 1920

SUBJECT to His Majesty's approval, Captain John Joseph Liston, MB has been permitted by the Right Hon'ble the Secretary of State for India to resign his commission, with effect from the 20th February, 1920

TEMPORARY CAPTAIN MAHADEV SUBRAMANIAM is permitted, subject to His Majesty's approval, to resign his commission, with effect from the 26th April, 1920

HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to make the following appointments *vice* Lieutenant-Colonel A V Anderson, MB, DPH, IMS (retired) — Dr Jamshyd Dadabhai Munsiff, MRCP, FRCS, DPH (Edin), to be Deputy Sanitary Commissioner, Western Registration District

Major I Davenport Jones, MD (London), IMS, in addition to his own duties to act as Deputy Sanitary Commissioner, Gujarat Registration District, *vice* Dr J D Munsiff, pending further orders

MR Y G NADGIR, MS, Professor of Anatomy, Grant Medical College, is granted, with effect from the date of relief, such privilege leave of absence (made up of five days' leave on full pay and the rest on half pay) as may be due to him on that date in combination with leave on private affairs for such period as may bring the combined period of absence up to six months

HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to appoint Mr B P Sabawalla, LM & S, MRCS LRCP, FRCS to act as Professor of Anatomy, Grant Medical College, during the absence on leave of Mr Y G Nadgir, MS

LIEUTENANT-COLONEL H M H MELHUISH, DPH IMS, was on special duty under the Sanitary Commissioner for the Government of Bombay from the 24th to 26th April 1920, both days inclusive

HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to declare that the furlough granted to Lieutenant-Colonel V B Bennett, MBBS (Lond), FRCS, IMS, in Government Notification No 2307 dated the 13th March 1920 should be considered as furlough on average salary

HIS EXCELLENCY THE GOVERNOR IN COUNCIL is pleased to appoint Mr V S Bhide, ICS, in addition to his own duties to do duty as Superintendent of Miththeran, so far as the civil administrative duties of the office are concerned, *vice* Lieutenant-Colonel H A F Knapton, IMS proceeding on leave, pending further orders

CAPTAIN D K SABHESAN, IMS, Military Medical officer to hold Civil Medical charge of Rurki, in addition to his own duties, *vice* Captain P R Vakil, IMS

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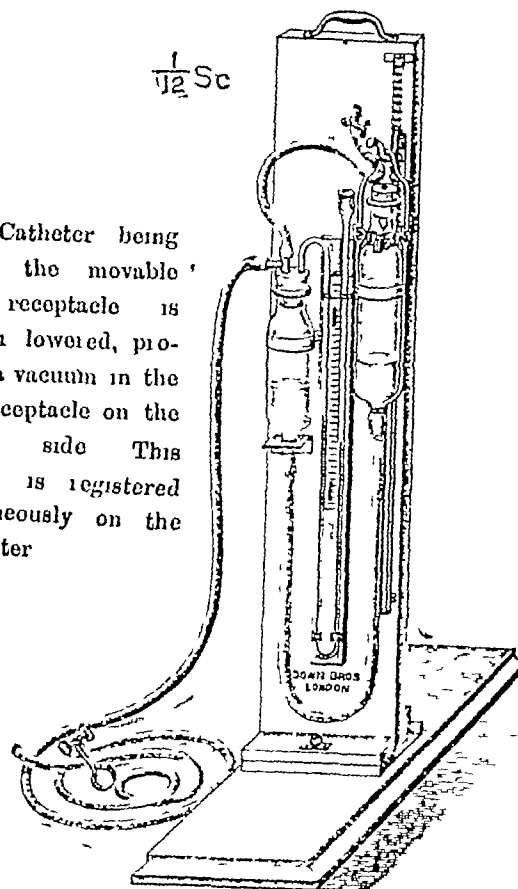
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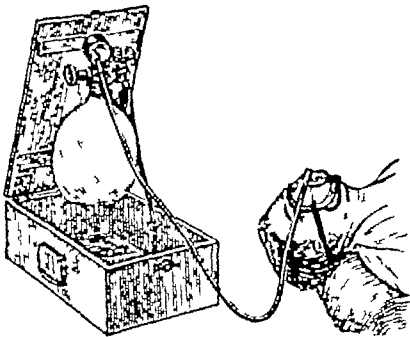
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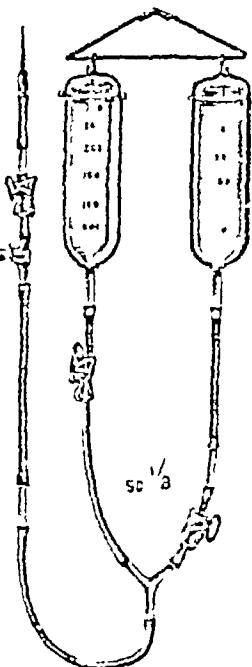
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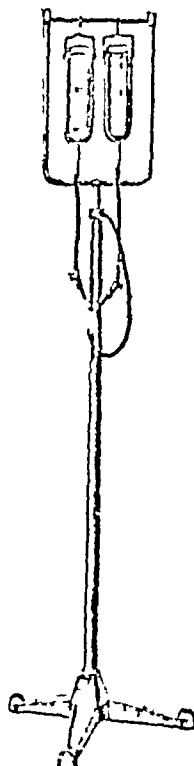
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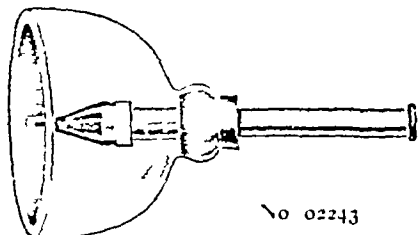
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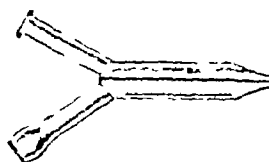
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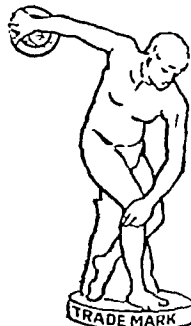
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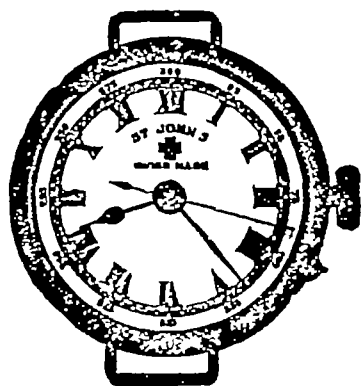
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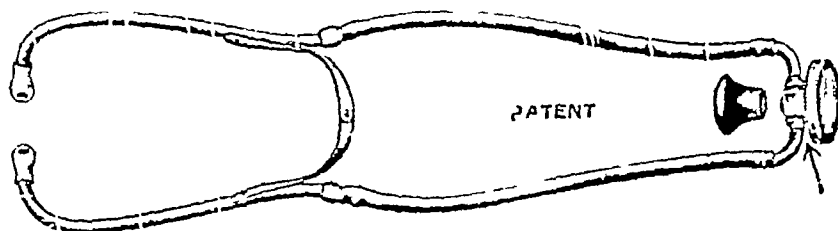
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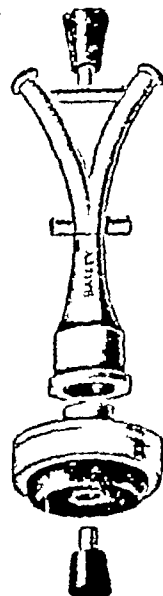
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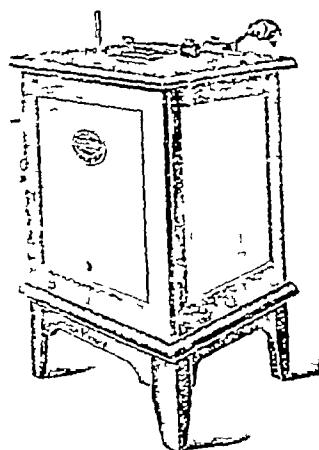
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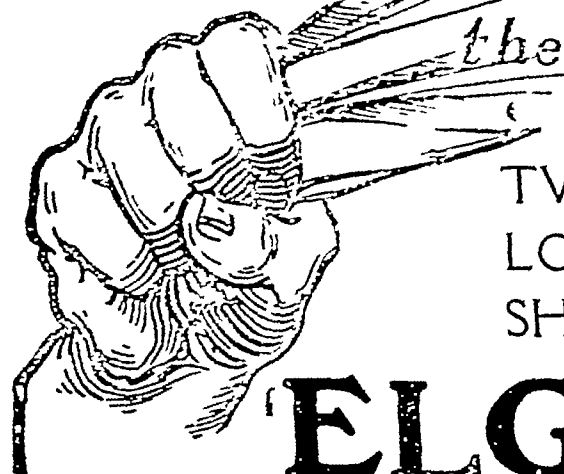
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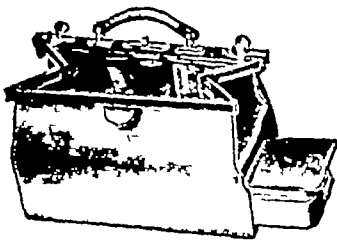
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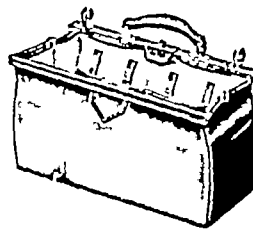
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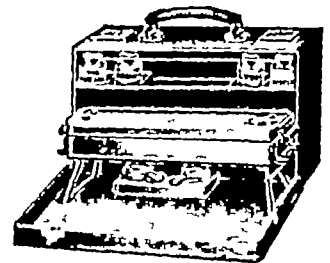
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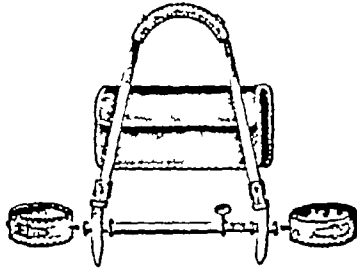
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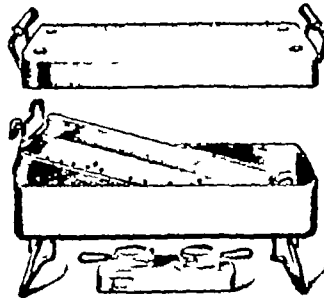
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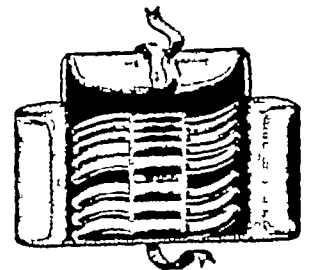
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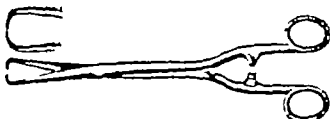
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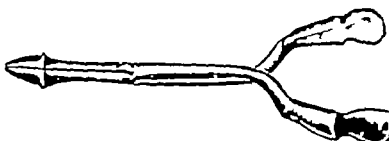
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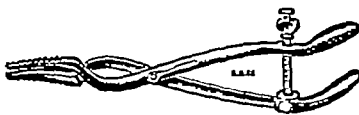
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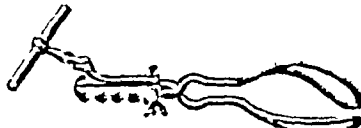
T3217. **Wright's Dilator** 21



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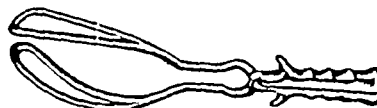
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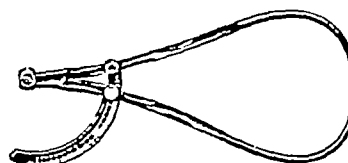
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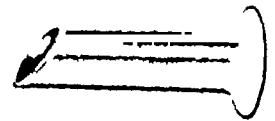
T3137. **Martin's Polvimeter** 27 0



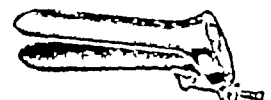
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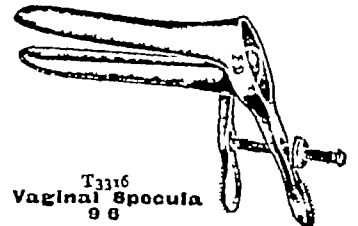
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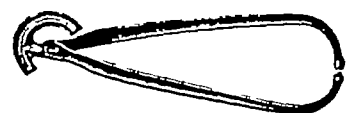
T3316. **Vaginal Speculum** 8 0



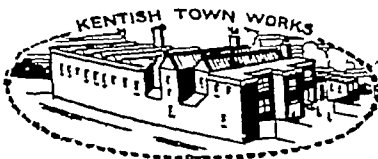
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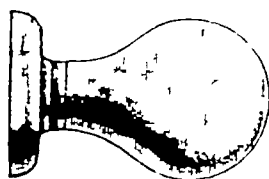
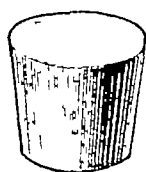
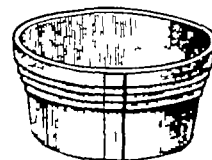
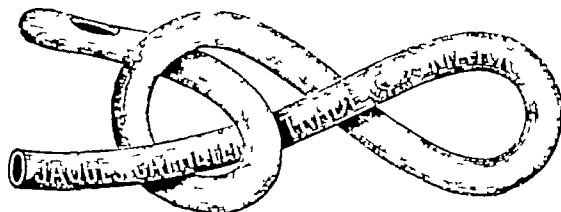
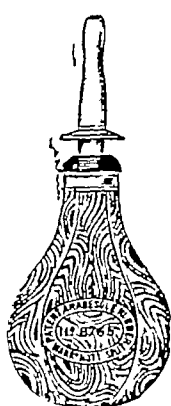
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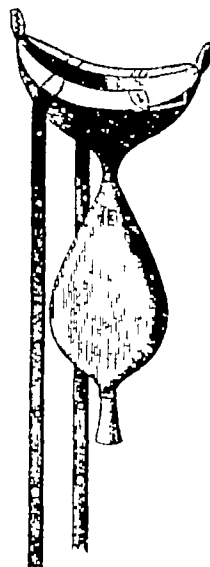
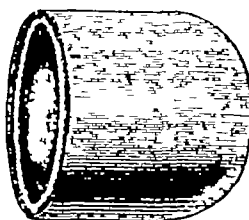


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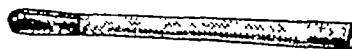
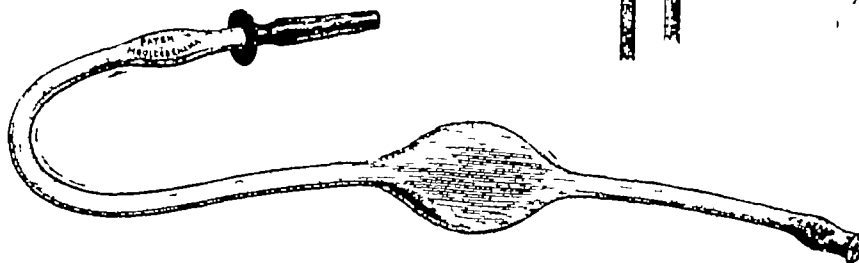
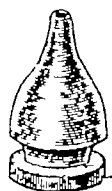
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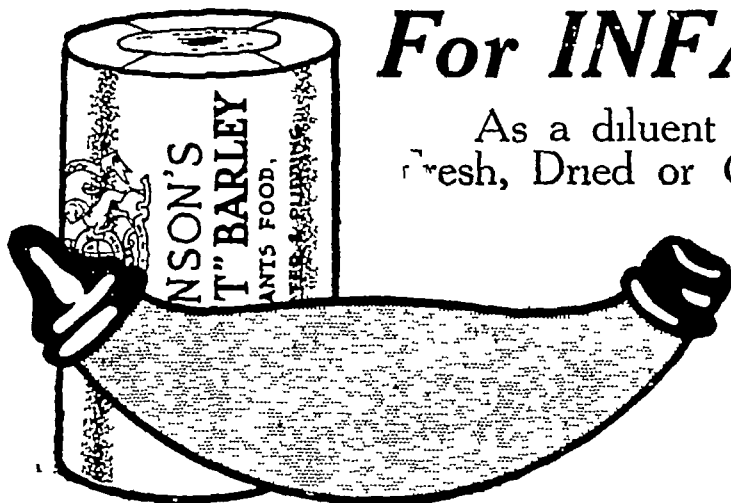
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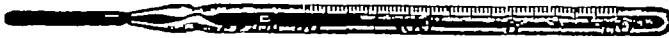
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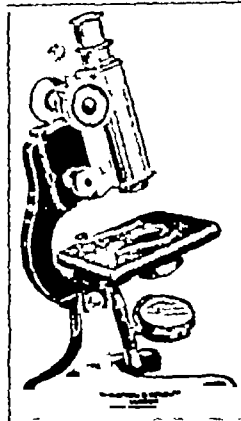
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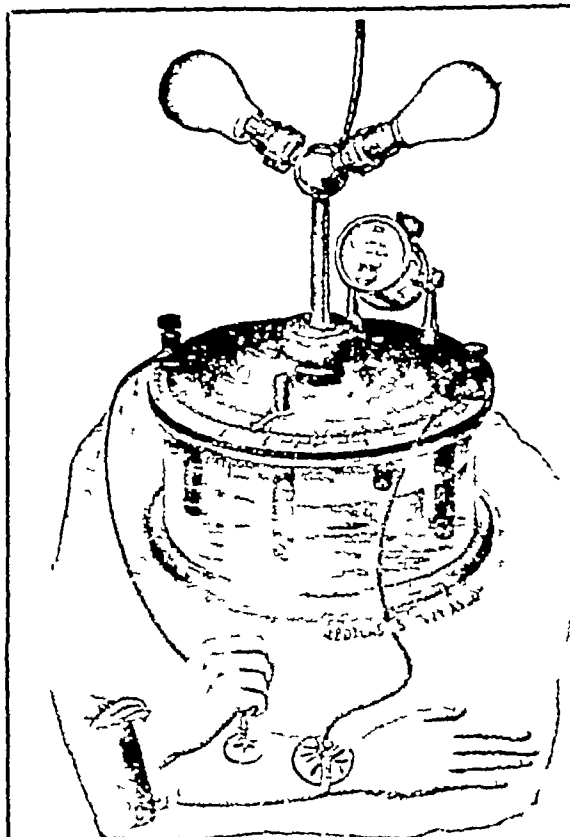
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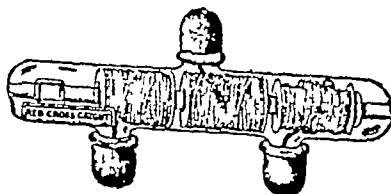
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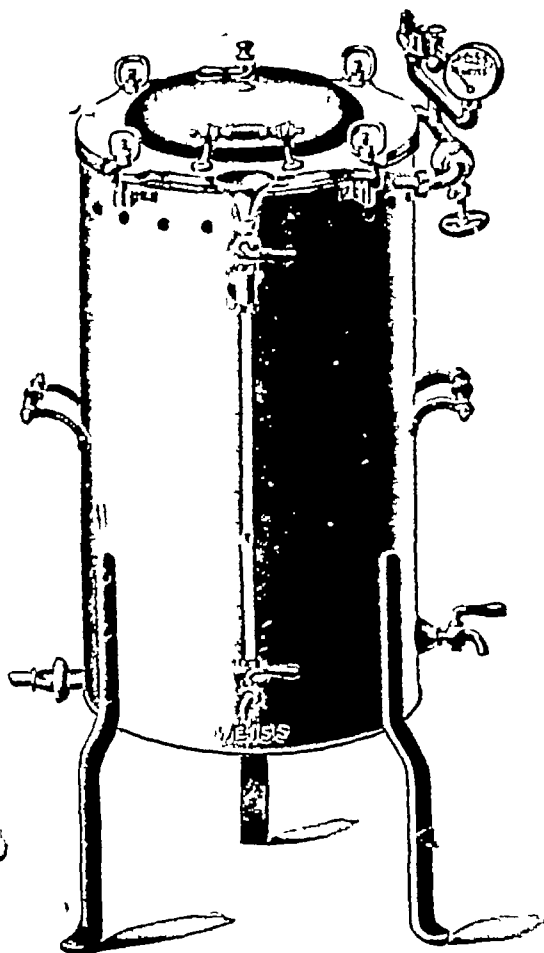
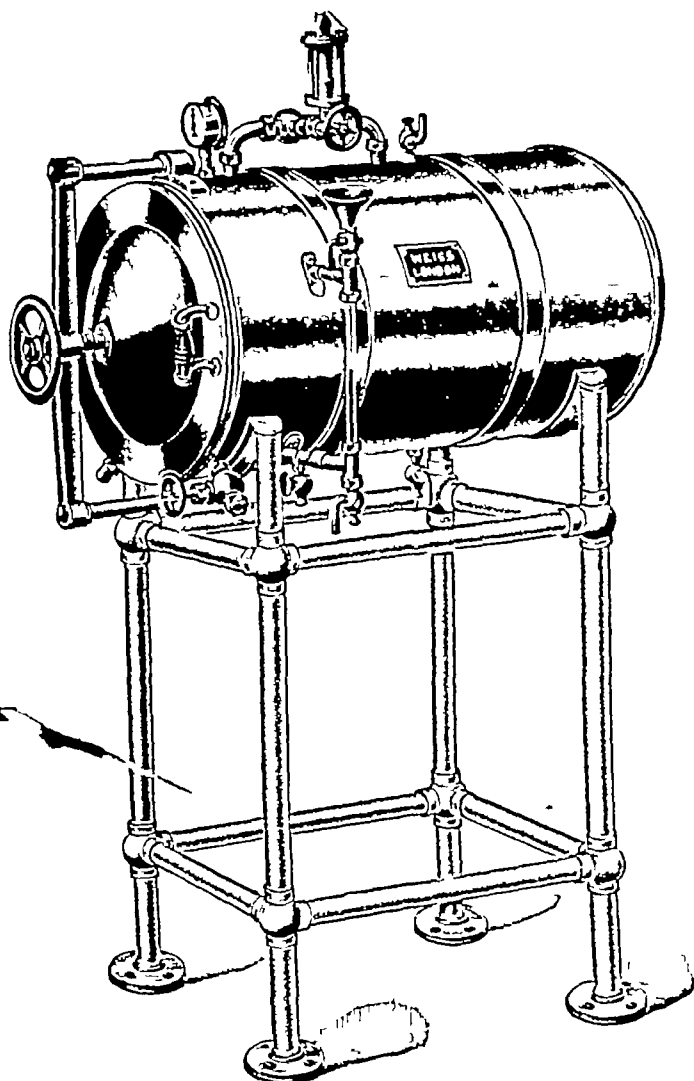
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